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**Department of Defense
Fiscal Year (FY) 2023 Budget Estimates**

April 2022



Office of the Secretary Of Defense

Defense-Wide Justification Book Volume 3 of 5

Research, Development, Test & Evaluation, Defense-Wide

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Office of the Secretary Of Defense • Budget Estimates FY 2023 • RDT&E Program

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Department of Defense
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
Total Obligational Authority
(Dollars in Thousands)

07 Apr 2022

Appropriation -----	FY 2021 (Base + OCO)	FY 2022 Less Supplementals Enactment	FY 2022 Division B Division C P.L.117-43 Enactment*	FY 2022 Division B P.L.117-70 Enactment**	FY 2022 Division A P.L. 117-86 Enactment***	FY 2022 Division N P.L. 117-103 Enactment****
-----	-----	-----	-----	-----	-----	-----
Research, Development, Test & Eval, DW	5,593,632	7,030,733				27,900
Total Research, Development, Test & Evaluation	5,593,632	7,030,733				27,900

R-123PBP: FY 2023 President's Budget (Total Base Published Version), as of April 7, 2022 at 10:04:04

*Includes enacted funding pursuant to the Extending Government Funding and Delivering Emergency Assistance Act (Public Law 117-43).

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Department of Defense
FY 2023 President's Budget
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(Dollars in Thousands)

07 Apr 2022

Appropriation -----	FY 2022 Total Supplemental Enactment -----	FY 2022 Total Enactment -----	FY 2023 Request -----
Research, Development, Test & Eval, DW	27,900	7,058,633	7,578,029
Total Research, Development, Test & Evaluation	27,900	7,058,633	7,578,029

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Department of Defense
FY 2023 President's Budget
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07 Apr 2022

	FY 2021 (Base + OCO)	FY 2022 Less Supplementals Enactment	FY 2022 Division B Division C P.L.117-43 Enactment*	FY 2022 Division B P.L.117-70 Enactment**	FY 2022 Division A P.L. 117-86 Enactment***	FY 2022 Division N P.L. 117-103 Enactment****
Summary Recap of Budget Activities -----						
Basic Research	282,531	341,787				
Applied Research	166,044	233,209				
Advanced Technology Development	1,348,934	1,790,289				
Advanced Component Development & Prototypes	1,998,000	2,273,771				
System Development & Demonstration	308,152	196,209				
Management Support	965,864	1,427,599				
Operational Systems Development	277,944	502,213				
Software And Digital Technology Pilot Programs	246,163	265,656				27,900
Total Research, Development, Test & Evaluation	5,593,632	7,030,733				27,900
Summary Recap of FYDP Programs -----						
General Purpose Forces	2,985	2,925				
Intelligence and Communications	357,394	418,835				27,900
Research and Development	5,232,350	6,608,973				
Administration and Associated Activities	903					
Total Research, Development, Test & Evaluation	5,593,632	7,030,733				27,900

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	FY 2022 Total Supplemental Enactment	FY 2022 Total Enactment	FY 2023 Request
Summary Recap of Budget Activities -----			
Basic Research		341,787	244,278
Applied Research		233,209	237,576
Advanced Technology Development		1,790,289	1,756,415
Advanced Component Development & Prototypes		2,273,771	2,605,675
System Development & Demonstration		196,209	642,864
Management Support		1,427,599	1,237,492
Operational Systems Development		502,213	736,606
Software And Digital Technology Pilot Programs	27,900	293,556	117,123
Total Research, Development, Test & Evaluation	27,900	7,058,633	7,578,029
Summary Recap of FYDP Programs -----			
General Purpose Forces		2,925	3,034
Intelligence and Communications	27,900	446,735	157,254
Research and Development		6,608,973	7,417,741
Administration and Associated Activities			
Total Research, Development, Test & Evaluation	27,900	7,058,633	7,578,029

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Office of Secretary of Defense	5,593,632	7,030,733				27,900
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(Dollars in Thousands)

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Appropriation: 0400D Research, Development, Test & Eval, DW

Line	Program Element No Number	Item Item	Act Act	FY 2021 (Base + OCO)	FY 2022 Less Supplementals Enactment	FY 2022 Division B Division C P.L.117-43 Enactment*	FY 2022 Division B P.L.117-70 Enactment**	FY 2022 Division A P.L. 117-86 Enactment***	FY 2022 Division N P.L. 117-103 Enactment****	S e c
3	0601108D8Z	High Energy Laser Research Initiatives	01		20,342					U
4	0601110D8Z	Basic Research Initiatives	01	72,992	76,702					U
6	0601120D8Z	National Defense Education Program	01	132,522	144,841					U
7	0601228D8Z	Historically Black Colleges and Universities/Minority Institutions	01	77,017	99,902					U
	Basic Research			282,531	341,787					
9	0601228D8Z	Historically Black Colleges and Universities/Minority Institutions	02	1,280						U
10	0602000D8Z	Joint Munitions Technology	02	24,098	20,529					U
12	0602128D8Z	Promotion and Protection Strategies	02							U
14	0602230D8Z	Defense Technology Innovation	02	17,109	17,428					U
15	0602234D8Z	Lincoln Laboratory Research Program	02	38,338	55,516					U
16	0602251D8Z	Applied Research for the Advancement of S&T Priorities	02	51,675	58,982					U
20	0602668D8Z	Cyber Security Research	02	24,328	25,331					U
21	0602675D8Z	Social Sciences for Environmental Security	02							U
26	0602751D8Z	Software Engineering Institute (SEI) Applied Research	02	9,216	9,571					U

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Line	Program Element No Number	Item ----	Act ---	FY 2022 Total Supplemental Enactment -----	FY 2022 Total Enactment -----	FY 2023 Request -----	S e c -
3	0601108D8Z	High Energy Laser Research Initiatives	01		20,342	16,257	U
4	0601110D8Z	Basic Research Initiatives	01		76,702	62,386	U
6	0601120D8Z	National Defense Education Program	01		144,841	132,347	U
7	0601228D8Z	Historically Black Colleges and Universities/Minority Institutions	01		99,902	33,288	U
	Basic Research			-----	341,787	244,278	
9	0601228D8Z	Historically Black Colleges and Universities/Minority Institutions	02				U
10	0602000D8Z	Joint Munitions Technology	02		20,529	18,961	U
12	0602128D8Z	Promotion and Protection Strategies	02			3,275	U
14	0602230D8Z	Defense Technology Innovation	02		17,428	20,634	U
15	0602234D8Z	Lincoln Laboratory Research Program	02		55,516	46,159	U
16	0602251D8Z	Applied Research for the Advancement of S&T Priorities	02		58,982	67,666	U
20	0602668D8Z	Cyber Security Research	02		25,331	17,264	U
21	0602675D8Z	Social Sciences for Environmental Security	02			4,000	U
26	0602751D8Z	Software Engineering Institute (SEI) Applied Research	02		9,571	11,030	U

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27	0602890D8Z	High Energy Laser Research	02		45,852					U
		Applied Research		166,044	233,209					
29	0603000D8Z	Joint Munitions Advanced Technology	03	21,625	30,140					U
30	0603121D8Z	SO/LIC Advanced Development	03	4,904	4,665					U
31	0603122D8Z	Combating Terrorism Technology Support	03	140,882	141,876					U
32	0603133D8Z	Foreign Comparative Testing	03	23,651	25,352					U
38	0603183D8Z	Joint Hypersonic Technology Development & Transition	03		51,178					U
39	0603225D8Z	Joint DoD-DoE Munitions Technology Development	03	18,809	19,003					U
42	0603288D8Z	Analytic Assessments	03	19,107	23,936					U
43	0603289D8Z	Advanced Innovative Analysis and Concepts	03	28,008	46,351					U
44	0603291D8Z	Advanced Innovative Analysis and Concepts - MHA	03	14,168						U
46	0603338D8Z	Defense Modernization and Prototyping	03	150,480	96,579					U
47	0603342D8Z	Defense Innovation Unit (DIU)	03	34,401	26,749					U
48	0603375D8Z	Technology Innovation	03	25,884	39,761					U
50	0603527D8Z	RETRACT LARCH	03	90,918	98,862					U

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27	0602890D8Z	High Energy Laser Research	02		45,852	48,587	U
		Applied Research			233,209	237,576	
29	0603000D8Z	Joint Munitions Advanced Technology	03		30,140	34,065	U
30	0603121D8Z	SO/LIC Advanced Development	03		4,665	4,919	U
31	0603122D8Z	Combating Terrorism Technology Support	03		141,876	72,614	U
32	0603133D8Z	Foreign Comparative Testing	03		25,352	26,802	U
38	0603183D8Z	Joint Hypersonic Technology Development & Transition	03		51,178	52,156	U
39	0603225D8Z	Joint DoD-DoE Munitions Technology Development	03		19,003	18,898	U
42	0603288D8Z	Analytic Assessments	03		23,936	24,052	U
43	0603289D8Z	Advanced Innovative Analysis and Concepts	03		46,351	53,890	U
44	0603291D8Z	Advanced Innovative Analysis and Concepts - MHA	03				U
46	0603338D8Z	Defense Modernization and Prototyping	03		96,579	141,561	U
47	0603342D8Z	Defense Innovation Unit (DIU)	03		26,749	42,925	U
48	0603375D8Z	Technology Innovation	03		39,761	109,535	U
50	0603527D8Z	RETRACT LARCH	03		98,862	79,493	U

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51	0603618D8Z	Joint Electronic Advanced Technology	03	14,773	18,164					U
52	0603648D8Z	Joint Capability Technology Demonstrations	03	69,482	102,345					U
53	0603662D8Z	Networked Communications Capabilities	03	5,692	2,975					U
54	0603680D8Z	Defense-Wide Manufacturing Science and Technology Program	03	237,098	255,244					U
57	0603716D8Z	Strategic Environmental Research Program	03	79,661	91,571					U
59	0603727D8Z	Joint Warfighting Program	03	3,727	2,157					U
64	0603769D8Z	Distributed Learning Advanced Technology Development	03	6,588	6,056					U
65	0603781D8Z	Software Engineering Institute	03	12,128	14,631					U
66	0603924D8Z	High Energy Laser Advanced Technology Program	03	109,113	83,159					U
67	0603941D8Z	Test & Evaluation Science & Technology	03	171,891	464,850					U
68	0603950D8Z	National Security Innovation Network	03	38,532	36,203					U
69	0604055D8Z	Operational Energy Capability Improvement	03	15,413	108,482					U
70	0303367D8Z	Spectrum Access Research and Development	03	11,096						U

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51	0603618D8Z	Joint Electronic Advanced Technology	03		18,164	19,218	U
52	0603648D8Z	Joint Capability Technology Demonstrations	03		102,345	114,100	U
53	0603662D8Z	Networked Communications Capabilities	03		2,975	3,168	U
54	0603680D8Z	Defense-Wide Manufacturing Science and Technology Program	03		255,244	256,142	U
57	0603716D8Z	Strategic Environmental Research Program	03		91,571	58,411	U
59	0603727D8Z	Joint Warfighting Program	03		2,157	2,411	U
64	0603769D8Z	Distributed Learning Advanced Technology Development	03		6,056	201	U
65	0603781D8Z	Software Engineering Institute	03		14,631	13,417	U
66	0603924D8Z	High Energy Laser Advanced Technology Program	03		83,159	111,149	U
67	0603941D8Z	Test & Evaluation Science & Technology	03		464,850	315,090	U
68	0603950D8Z	National Security Innovation Network	03		36,203	22,028	U
69	0604055D8Z	Operational Energy Capability Improvement	03		108,482	180,170	U
70	0303367D8Z	Spectrum Access Research and Development	03				U

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71	0909999D8Z	Financing for Cancelled Account Adjustments	03	903						U
		Advanced Technology Development		1,348,934	1,790,289					
74	0603161D8Z	Nuclear and Conventional Physical Security Equipment RDT&E ADC&P	04	31,634	28,525					U
75	0603600D8Z	WALKOFF	04	98,841	108,652					U
76	0603851D8Z	Environmental Security Technical Certification Program	04	72,135	122,737					U
92	0603923D8Z	Coalition Warfare	04	9,975	5,074					U
93	0604011D8Z	Next Generation Information Communications Technology (5G)	04	428,127	336,485					U
94	0604016D8Z	Department of Defense Corrosion Program	04	5,240	3,241					U
97	0604124D8Z	Chief Digital and Artificial Intelligence Officer (CDAO) - MIP	04							U
100	0604250D8Z	Advanced Innovative Technologies	04	732,208	777,199					U
101	0604294D8Z	Trusted & Assured Microelectronics	04	489,251	704,091					U
102	0604331D8Z	Rapid Prototyping Program	04	89,318	137,349					U
103	0604341D8Z	Defense Innovation Unit (DIU) Prototyping	04	30,108	16,178					U
104	0604400D8Z	Department of Defense (DoD) Unmanned System Common Development	04	6,825	7,762					U

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07 Apr 2022

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Line	Program Element No Number	Item ----	Act ---	FY 2022 Total Supplemental Enactment -----	FY 2022 Total Enactment -----	FY 2023 Request -----	S e c -
71	0909999D8Z	Financing for Cancelled Account Adjustments	03				U
		Advanced Technology Development			1,790,289	1,756,415	
74	0603161D8Z	Nuclear and Conventional Physical Security Equipment RDT&E ADC&P	04		28,525	41,507	U
75	0603600D8Z	WALKOFF	04		108,652	133,795	U
76	0603851D8Z	Environmental Security Technical Certification Program	04		122,737	84,638	U
92	0603923D8Z	Coalition Warfare	04		5,074	11,154	U
93	0604011D8Z	Next Generation Information Communications Technology (5G)	04		336,485	249,591	U
94	0604016D8Z	Department of Defense Corrosion Program	04		3,241	3,166	U
97	0604124D8Z	Chief Digital and Artificial Intelligence Officer (CDAO) - MIP	04			33,950	U
100	0604250D8Z	Advanced Innovative Technologies	04		777,199	1,145,358	U
101	0604294D8Z	Trusted & Assured Microelectronics	04		704,091	647,226	U
102	0604331D8Z	Rapid Prototyping Program	04		137,349	179,189	U
103	0604341D8Z	Defense Innovation Unit (DIU) Prototyping	04		16,178	24,402	U
104	0604400D8Z	Department of Defense (DoD) Unmanned System Common Development	04		7,762	2,691	U

R-123PBP: FY 2023 President's Budget (Total Base Published Version), as of April 7, 2022 at 10:04:04

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Defense-Wide
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
Total Obligational Authority
(Dollars in Thousands)

07 Apr 2022

Appropriation: 0400D Research, Development, Test & Eval, DW

Line	Program Element No Number	Item -----	Act ---	FY 2021 (Base + OCO) -----	FY 2022 Less Supplementals Enactment -----	FY 2022 Division B Division C P.L.117-43 Enactment* -----	FY 2022 Division B P.L.117-70 Enactment** -----	FY 2022 Division A P.L. 117-86 Enactment*** -----	FY 2022 Division N P.L. 117-103 Enactment**** -----	S e c -
106	0604555D8Z	Operational Energy Capability Improvement - Non S&T	04		23,069					U
108	0604682D8Z	Wargaming and Support for Strategic Analysis (SSA)	04	3,341	3,409					U
119	0303191D8Z	Joint Electromagnetic Technology (JET) Program	04	997						U
	Advanced Component Development & Prototypes			1,998,000	2,273,771					
124	0604123D8Z	Chief Digital and Artificial Intelligence Officer (CDAO) - Dem/Val Activities	05							U
125	0604161D8Z	Nuclear and Conventional Physical Security Equipment RDT&E SDD	05	7,045	5,650					U
126	0604165D8Z	Prompt Global Strike Capability Development	05	89,156						U
128	0604771D8Z	Joint Tactical Information Distribution System (JTIDS)	05	49,458	21,292					U
132	0605022D8Z	Defense Exportability Program	05	12,649	5,416					U
133	0605027D8Z	OUSD(C) IT Development Initiatives	05	9,883	16,892					U
135	0605075D8Z	CMO Policy and Integration	05	1,295						U
138	0605210D8Z	Defense-Wide Electronic Procurement Capabilities	05	7,970	7,108					U
139	0605294D8Z	Trusted & Assured Microelectronics	05	104,180	113,536					U

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Defense-Wide
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
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Appropriation: 0400D Research, Development, Test & Eval, DW

Line	Program Element No Number	Item -----	Act ---	FY 2022 Total Supplemental Enactment -----	FY 2022 Total Enactment -----	FY 2023 Request -----	S e c -
106	0604555D8Z	Operational Energy Capability Improvement - Non S&T	04		23,069	45,779	U
108	0604682D8Z	Wargaming and Support for Strategic Analysis (SSA)	04		3,409	3,229	U
119	0303191D8Z	Joint Electromagnetic Technology (JET) Program	04				U
	Advanced Component Development & Prototypes				2,273,771	2,605,675	
124	0604123D8Z	Chief Digital and Artificial Intelligence Officer (CDAO) - Dem/Val Activities	05			273,340	U
125	0604161D8Z	Nuclear and Conventional Physical Security Equipment RDT&E SDD	05		5,650	6,482	U
126	0604165D8Z	Prompt Global Strike Capability Development	05				U
128	0604771D8Z	Joint Tactical Information Distribution System (JTIDS)	05		21,292	9,120	U
132	0605022D8Z	Defense Exportability Program	05		5,416	10,145	U
133	0605027D8Z	OUSD(C) IT Development Initiatives	05		16,892	5,938	U
135	0605075D8Z	CMO Policy and Integration	05				U
138	0605210D8Z	Defense-Wide Electronic Procurement Capabilities	05		7,108	6,949	U
139	0605294D8Z	Trusted & Assured Microelectronics	05		113,536	302,963	U

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Line	Program Element No Number	Item -----	Act ---	FY 2021 (Base + OCO) -----	FY 2022 Less Supplementals Enactment -----	FY 2022 Division B Division C P.L.117-43 Enactment* -----	FY 2022 Division B P.L.117-70 Enactment** -----	FY 2022 Division A P.L. 117-86 Enactment*** -----	FY 2022 Division N P.L. 117-103 Enactment**** -----	S e c -
140	0605772D8Z	Nuclear Command, Control, & Communications	05	3,547	3,969					U
141	0305304D8Z	DoD Enterprise Energy Information Management (EEIM)	05	3,152	2,214					U
142	0305310D8Z	CWMD Systems: System Development and Demonstration	05	19,817	20,132					U
		System Development & Demonstration		308,152	196,209					
144	0604774D8Z	Defense Readiness Reporting System (DRRS)	06	9,586	7,167					U
145	0604875D8Z	Joint Systems Architecture Development	06	8,180	7,815					U
146	0604940D8Z	Central Test and Evaluation Investment Development (CTEIP)	06	407,678	994,151					U
147	0604942D8Z	Assessments and Evaluations	06	18,296	17,879					U
149	0605100D8Z	Joint Mission Environment Test Capability (JMETC)	06	76,146	71,410					U
151	0605128D8Z	Classified Program USD(P)	06	110,000	108,112					U
152	0605142D8Z	Systems Engineering	06	44,168	39,904					U
153	0605151D8Z	Studies and Analysis Support - OSD	06	6,720	4,612					U
154	0605161D8Z	Nuclear Matters-Physical Security	06	16,013	14,348					U
155	0605170D8Z	Support to Networks and Information Integration	06	9,230	4,759					U

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Defense-Wide
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Line	Program Element No Number	Item -----	Act ---	FY 2022 Total Supplemental Enactment -----	FY 2022 Total Enactment -----	FY 2023 Request -----	S e c -
140	0605772D8Z	Nuclear Command, Control, & Communications	05		3,969	3,758	U
141	0305304D8Z	DoD Enterprise Energy Information Management (EEIM)	05		2,214	8,121	U
142	0305310D8Z	CWMD Systems: System Development and Demonstration	05		20,132	16,048	U
	System Development & Demonstration			-----	196,209	642,864	
144	0604774D8Z	Defense Readiness Reporting System (DRRS)	06		7,167	8,902	U
145	0604875D8Z	Joint Systems Architecture Development	06		7,815	6,610	U
146	0604940D8Z	Central Test and Evaluation Investment Development (CTEIP)	06		994,151	819,358	U
147	0604942D8Z	Assessments and Evaluations	06		17,879	4,607	U
149	0605100D8Z	Joint Mission Environment Test Capability (JMETC)	06		71,410	126,079	U
151	0605128D8Z	Classified Program USD(P)	06		108,112		U
152	0605142D8Z	Systems Engineering	06		39,904	39,009	U
153	0605151D8Z	Studies and Analysis Support - OSD	06		4,612	5,716	U
154	0605161D8Z	Nuclear Matters-Physical Security	06		14,348	15,379	U
155	0605170D8Z	Support to Networks and Information Integration	06		4,759	9,449	U

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Line	Program Element No Number	Item ----	Act ---	FY 2021 (Base + OCO) -----	FY 2022 Less Supplementals Enactment -----	FY 2022 Division B Division C P.L.117-43 Enactment* -----	FY 2022 Division B P.L.117-70 Enactment** -----	FY 2022 Division A P.L. 117-86 Enactment*** -----	FY 2022 Division N P.L. 117-103 Enactment**** -----	S e c -
156	0605200D8Z	General Support to OUSD(Intelligence and Security)	06	7,904	10,452					U
161	0605502D8Z	Small Business Innovative Research	06	156,944						U
165	0605790D8Z	Small Business Innovation Research (SBIR)/ Small Business Technology Transfer	06	3,582	3,628					U
166	0605797D8Z	Maintaining Technology Advantage	06	24,735	26,807					U
167	0605798D8Z	Defense Technology Analysis	06	22,544	35,149					U
170	0605804D8Z	Development Test and Evaluation	06	26,240	27,280					U
173	0606100D8Z	Budget and Program Assessments	06	10,729	13,994					U
174	0606114D8Z	Analysis Working Group (AWG) Support	06							U
175	0606135D8Z	Chief Digital and Artificial Intelligence Officer (CDAO) Activities	06							U
176	0606225D8Z	ODNA Technology and Resource Analysis	06	3,200	4,897					U
177	0606300D8Z	Defense Science Board	06							U
179	0606771D8Z	Cyber Resiliency and Cybersecurity Policy	06		31,460					U
181	0203345D8Z	Defense Operations Security Initiative (DOSI)	06	2,985	2,925					U

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Defense-Wide
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Exhibit R-1 FY 2023 President's Budget
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Line	Program Element No Number	Item -----	Act ---	FY 2022 Total Supplemental Enactment -----	FY 2022 Total Enactment -----	FY 2023 Request -----	S e c -
156	0605200D8Z	General Support to OUSD(Intelligence and Security)	06		10,452	6,112	U
161	0605502D8Z	Small Business Innovative Research	06				U
165	0605790D8Z	Small Business Innovation Research (SBIR)/ Small Business Technology Transfer	06		3,628	3,820	U
166	0605797D8Z	Maintaining Technology Advantage	06		26,807	35,414	U
167	0605798D8Z	Defense Technology Analysis	06		35,149	56,114	U
170	0605804D8Z	Development Test and Evaluation	06		27,280	26,652	U
173	0606100D8Z	Budget and Program Assessments	06		13,994	15,244	U
174	0606114D8Z	Analysis Working Group (AWG) Support	06			4,700	U
175	0606135D8Z	Chief Digital and Artificial Intelligence Officer (CDAO) Activities	06			13,132	U
176	0606225D8Z	ODNA Technology and Resource Analysis	06		4,897	3,323	U
177	0606300D8Z	Defense Science Board	06			2,532	U
179	0606771D8Z	Cyber Resiliency and Cybersecurity Policy	06		31,460	32,306	U
181	0203345D8Z	Defense Operations Security Initiative (DOSI)	06		2,925	3,034	U

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Exhibit R-1 FY 2023 President's Budget
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(Dollars in Thousands)

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Appropriation: 0400D Research, Development, Test & Eval, DW

Line	Program Element No Number	Item -----	Act ---	FY 2021 (Base + OCO) -----	FY 2022 Less Supplementals Enactment -----	FY 2022 Division B Division C P.L.117-43 Enactment* -----	FY 2022 Division B P.L.117-70 Enactment** -----	FY 2022 Division A P.L. 117-86 Enactment*** -----	FY 2022 Division N P.L. 117-103 e Enactment**** -----	S e c -
188	0303260D8Z	Defense Military Deception Program Office (DMDPO)	06	984	850					U
		Management Support		965,864	1,427,599					
200	0607210D8Z	Industrial Base Analysis and Sustainment Support	07	170,207	335,410					U
201	0607310D8Z	CWMD Systems: Operational Systems Development	07	16,332	18,616					U
213	0303140D8Z	Information Systems Security Program	07	46,529	69,191					U
223	0303767D8Z	AMBIT - Pre-Auctioned SRF	07	15,420						U
226	0305104D8Z	Defense Industrial Base (DIB) Cyber Security Initiative	07							U
234	0305172D8Z	Combined Advanced Applications	07							U
237	0305186D8Z	Policy R&D Programs	07	6,322	4,591					U
238	0305199D8Z	Net Centricity	07	20,994	13,132					U
246	0305245D8Z	Intelligence Capabilities and Innovation Investments	07		60,000					U
249	0305387D8Z	Homeland Defense Technology Transfer Program	07	2,140	1,273					U
		Operational Systems Development		277,944	502,213					
275	0608648D8Z	Acquisition Visibility - Software Pilot Program	08	16,220	18,204					U

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Defense-Wide
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
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(Dollars in Thousands)

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Line	Program Element No Number	Item -----	Act ---	FY 2022 Total Supplemental Enactment -----	FY 2022 Total Enactment -----	FY 2023 Request -----	S e c -
188	0303260D8Z	Defense Military Deception Program Office (DMDPO)	06		850		U
		Management Support			1,427,599	1,237,492	
200	0607210D8Z	Industrial Base Analysis and Sustainment Support	07		335,410	588,094	U
201	0607310D8Z	CWMD Systems: Operational Systems Development	07		18,616	15,427	U
213	0303140D8Z	Information Systems Security Program	07		69,191	43,135	U
223	0303767D8Z	AMBIT - Pre-Auctioned SRF	07				U
226	0305104D8Z	Defense Industrial Base (DIB) Cyber Security Initiative	07			10,000	U
234	0305172D8Z	Combined Advanced Applications	07			49,380	U
237	0305186D8Z	Policy R&D Programs	07		4,591	6,214	U
238	0305199D8Z	Net Centricity	07		13,132	17,917	U
246	0305245D8Z	Intelligence Capabilities and Innovation Investments	07		60,000	4,575	U
249	0305387D8Z	Homeland Defense Technology Transfer Program	07		1,273	1,864	U
		Operational Systems Development			502,213	736,606	
275	0608648D8Z	Acquisition Visibility - Software Pilot Program	08		18,204	17,123	U

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(Dollars in Thousands)

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Appropriation: 0400D Research, Development, Test & Eval, DW

Line	Program Element No Number	Item	Act	FY 2021 (Base + OCO)	FY 2022 Less Supplementals Enactment	FY 2022 Division B Division C P.L.117-43 Enactment*	FY 2022 Division B P.L.117-70 Enactment**	FY 2022 Division A P.L. 117-86 Enactment***	FY 2022 Division N P.L. 117-103 Enactment****	S e c
--	-----	----	---	-----	-----	-----	-----	-----	-----	-
276	0608775D8Z	Accelerate the Procurement and Fielding of Innovative Technologies (APFIT)	08							U
281	0308588D8Z	Algorithmic Warfare Cross Functional Teams - Software Pilot Program	08	229,943	247,452				27,900	U
		Software And Digital Technology Pilot Progr		246,163	265,656				27,900	
				5,593,632	7,030,733				27,900	
		Total Research, Development, Test & Eval, DW								

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Defense-Wide
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
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(Dollars in Thousands)

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Appropriation: 0400D Research, Development, Test & Eval, DW

Line	Program Element No Number	Item -----	Act ---	FY 2022 Total Supplemental Enactment -----	FY 2022 Total Enactment -----	FY 2023 Request -----	S e c -
276	0608775D8Z	Accelerate the Procurement and Fielding of Innovative Technologies (APFIT)	08			100,000	U
281	0308588D8Z	Algorithmic Warfare Cross Functional Teams - Software Pilot Program	08	27,900	275,352		U
		Software And Digital Technology Pilot Progr		----- 27,900	----- 293,556	----- 117,123	
		Total Research, Development, Test & Eval, DW		----- 27,900	----- 7,058,633	----- 7,578,029	

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Office of Secretary of Defense
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(Dollars in Thousands)

07 Apr 2022

Appropriation: 0400D Research, Development, Test & Eval, DW

Line	Program Element No Number	Item Item	Act Act	FY 2021 (Base + OCO)	FY 2022 Less Supplementals Enactment	FY 2022 Division B Division C P.L.117-43 Enactment*	FY 2022 Division B P.L.117-70 Enactment**	FY 2022 Division A P.L. 117-86 Enactment***	FY 2022 Division N P.L. 117-103 Enactment****	S e c
3	0601108D8Z	High Energy Laser Research Initiatives	01		20,342					U
4	0601110D8Z	Basic Research Initiatives	01	72,992	76,702					U
6	0601120D8Z	National Defense Education Program	01	132,522	144,841					U
7	0601228D8Z	Historically Black Colleges and Universities/Minority Institutions	01	77,017	99,902					U
	Basic Research			282,531	341,787					
9	0601228D8Z	Historically Black Colleges and Universities/Minority Institutions	02	1,280						U
10	0602000D8Z	Joint Munitions Technology	02	24,098	20,529					U
12	0602128D8Z	Promotion and Protection Strategies	02							U
14	0602230D8Z	Defense Technology Innovation	02	17,109	17,428					U
15	0602234D8Z	Lincoln Laboratory Research Program	02	38,338	55,516					U
16	0602251D8Z	Applied Research for the Advancement of S&T Priorities	02	51,675	58,982					U
20	0602668D8Z	Cyber Security Research	02	24,328	25,331					U
21	0602675D8Z	Social Sciences for Environmental Security	02							U
26	0602751D8Z	Software Engineering Institute (SEI) Applied Research	02	9,216	9,571					U

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Office of Secretary of Defense
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Line	Program Element No Number	Item ----	Act ---	FY 2022 Total Supplemental Enactment -----	FY 2022 Total Enactment -----	FY 2023 Request -----	S e c -
3	0601108D8Z	High Energy Laser Research Initiatives	01		20,342	16,257	U
4	0601110D8Z	Basic Research Initiatives	01		76,702	62,386	U
6	0601120D8Z	National Defense Education Program	01		144,841	132,347	U
7	0601228D8Z	Historically Black Colleges and Universities/Minority Institutions	01		99,902	33,288	U
	Basic Research			-----	341,787	244,278	
9	0601228D8Z	Historically Black Colleges and Universities/Minority Institutions	02				U
10	0602000D8Z	Joint Munitions Technology	02		20,529	18,961	U
12	0602128D8Z	Promotion and Protection Strategies	02			3,275	U
14	0602230D8Z	Defense Technology Innovation	02		17,428	20,634	U
15	0602234D8Z	Lincoln Laboratory Research Program	02		55,516	46,159	U
16	0602251D8Z	Applied Research for the Advancement of S&T Priorities	02		58,982	67,666	U
20	0602668D8Z	Cyber Security Research	02		25,331	17,264	U
21	0602675D8Z	Social Sciences for Environmental Security	02			4,000	U
26	0602751D8Z	Software Engineering Institute (SEI) Applied Research	02		9,571	11,030	U

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Office of Secretary of Defense
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27	0602890D8Z	High Energy Laser Research	02		45,852					U
	Applied Research			166,044	233,209					
29	0603000D8Z	Joint Munitions Advanced Technology	03	21,625	30,140					U
30	0603121D8Z	SO/LIC Advanced Development	03	4,904	4,665					U
31	0603122D8Z	Combating Terrorism Technology Support	03	140,882	141,876					U
32	0603133D8Z	Foreign Comparative Testing	03	23,651	25,352					U
38	0603183D8Z	Joint Hypersonic Technology Development & Transition	03		51,178					U
39	0603225D8Z	Joint DoD-DoE Munitions Technology Development	03	18,809	19,003					U
42	0603288D8Z	Analytic Assessments	03	19,107	23,936					U
43	0603289D8Z	Advanced Innovative Analysis and Concepts	03	28,008	46,351					U
44	0603291D8Z	Advanced Innovative Analysis and Concepts - MHA	03	14,168						U
46	0603338D8Z	Defense Modernization and Prototyping	03	150,480	96,579					U
47	0603342D8Z	Defense Innovation Unit (DIU)	03	34,401	26,749					U
48	0603375D8Z	Technology Innovation	03	25,884	39,761					U
50	0603527D8Z	RETRACT LARCH	03	90,918	98,862					U

R-123PBP: FY 2023 President's Budget (Total Base Published Version), as of April 7, 2022 at 10:04:04

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Appropriation: 0400D Research, Development, Test & Eval, DW

Line	Program Element No Number	Item ----	Act ---	FY 2022 Total Supplemental Enactment -----	FY 2022 Total Enactment -----	FY 2023 Request -----	S e c -
27	0602890D8Z	High Energy Laser Research	02		48,852	48,587	U
	Applied Research				233,209	237,576	
29	0603000D8Z	Joint Munitions Advanced Technology	03		30,140	34,065	U
30	0603121D8Z	SO/LIC Advanced Development	03		4,665	4,919	U
31	0603122D8Z	Combating Terrorism Technology Support	03		141,876	72,614	U
32	0603133D8Z	Foreign Comparative Testing	03		25,352	26,802	U
38	0603183D8Z	Joint Hypersonic Technology Development & Transition	03		51,178	52,156	U
39	0603225D8Z	Joint DoD-DoE Munitions Technology Development	03		19,003	18,898	U
42	0603288D8Z	Analytic Assessments	03		23,936	24,052	U
43	0603289D8Z	Advanced Innovative Analysis and Concepts	03		46,351	53,890	U
44	0603291D8Z	Advanced Innovative Analysis and Concepts - MHA	03				U
46	0603338D8Z	Defense Modernization and Prototyping	03		96,579	141,561	U
47	0603342D8Z	Defense Innovation Unit (DIU)	03		26,749	42,925	U
48	0603375D8Z	Technology Innovation	03		39,761	109,535	U
50	0603527D8Z	RETRACT LARCH	03		98,862	79,493	U

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Line	Program Element No Number	Item ----	Act ---	FY 2021 (Base + OCO) -----	FY 2022 Less Supplementals Enactment -----	FY 2022 Division B Division C P.L.117-43 Enactment* -----	FY 2022 Division B P.L.117-70 Enactment** -----	FY 2022 Division A P.L. 117-86 Enactment*** -----	FY 2022 Division N P.L. 117-103 Enactment**** -----	S e c -
51	0603618D8Z	Joint Electronic Advanced Technology	03	14,773	18,164					U
52	0603648D8Z	Joint Capability Technology Demonstrations	03	69,482	102,345					U
53	0603662D8Z	Networked Communications Capabilities	03	5,692	2,975					U
54	0603680D8Z	Defense-Wide Manufacturing Science and Technology Program	03	237,098	255,244					U
57	0603716D8Z	Strategic Environmental Research Program	03	79,661	91,571					U
59	0603727D8Z	Joint Warfighting Program	03	3,727	2,157					U
64	0603769D8Z	Distributed Learning Advanced Technology Development	03	6,588	6,056					U
65	0603781D8Z	Software Engineering Institute	03	12,128	14,631					U
66	0603924D8Z	High Energy Laser Advanced Technology Program	03	109,113	83,159					U
67	0603941D8Z	Test & Evaluation Science & Technology	03	171,891	464,850					U
68	0603950D8Z	National Security Innovation Network	03	38,532	36,203					U
69	0604055D8Z	Operational Energy Capability Improvement	03	15,413	108,482					U
70	0303367D8Z	Spectrum Access Research and Development	03	11,096						U

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51	0603618D8Z	Joint Electronic Advanced Technology	03		18,164	19,218	U
52	0603648D8Z	Joint Capability Technology Demonstrations	03		102,345	114,100	U
53	0603662D8Z	Networked Communications Capabilities	03		2,975	3,168	U
54	0603680D8Z	Defense-Wide Manufacturing Science and Technology Program	03		255,244	256,142	U
57	0603716D8Z	Strategic Environmental Research Program	03		91,571	58,411	U
59	0603727D8Z	Joint Warfighting Program	03		2,157	2,411	U
64	0603769D8Z	Distributed Learning Advanced Technology Development	03		6,056	201	U
65	0603781D8Z	Software Engineering Institute	03		14,631	13,417	U
66	0603924D8Z	High Energy Laser Advanced Technology Program	03		83,159	111,149	U
67	0603941D8Z	Test & Evaluation Science & Technology	03		464,850	315,090	U
68	0603950D8Z	National Security Innovation Network	03		36,203	22,028	U
69	0604055D8Z	Operational Energy Capability Improvement	03		108,482	180,170	U
70	0303367D8Z	Spectrum Access Research and Development	03				U

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71	0909999D8Z	Financing for Cancelled Account Adjustments	03	903						U
		Advanced Technology Development		1,348,934	1,790,289					
74	0603161D8Z	Nuclear and Conventional Physical Security Equipment RDT&E ADC&P	04	31,634	28,525					U
75	0603600D8Z	WALKOFF	04	98,841	108,652					U
76	0603851D8Z	Environmental Security Technical Certification Program	04	72,135	122,737					U
92	0603923D8Z	Coalition Warfare	04	9,975	5,074					U
93	0604011D8Z	Next Generation Information Communications Technology (5G)	04	428,127	336,485					U
94	0604016D8Z	Department of Defense Corrosion Program	04	5,240	3,241					U
97	0604124D8Z	Chief Digital and Artificial Intelligence Officer (CDAO) - MIP	04							U
100	0604250D8Z	Advanced Innovative Technologies	04	732,208	777,199					U
101	0604294D8Z	Trusted & Assured Microelectronics	04	489,251	704,091					U
102	0604331D8Z	Rapid Prototyping Program	04	89,318	137,349					U
103	0604341D8Z	Defense Innovation Unit (DIU) Prototyping	04	30,108	16,178					U
104	0604400D8Z	Department of Defense (DoD) Unmanned System Common Development	04	6,825	7,762					U

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71	0909999D8Z	Financing for Cancelled Account Adjustments	03				U
	Advanced Technology Development				1,790,289	1,756,415	
74	0603161D8Z	Nuclear and Conventional Physical Security Equipment RDT&E ADC&P	04		28,525	41,507	U
75	0603600D8Z	WALKOFF	04		108,652	133,795	U
76	0603851D8Z	Environmental Security Technical Certification Program	04		122,737	84,638	U
92	0603923D8Z	Coalition Warfare	04		5,074	11,154	U
93	0604011D8Z	Next Generation Information Communications Technology (5G)	04		336,485	249,591	U
94	0604016D8Z	Department of Defense Corrosion Program	04		3,241	3,166	U
97	0604124D8Z	Chief Digital and Artificial Intelligence Officer (CDAO) - MIP	04			33,950	U
100	0604250D8Z	Advanced Innovative Technologies	04		777,199	1,145,358	U
101	0604294D8Z	Trusted & Assured Microelectronics	04		704,091	647,226	U
102	0604331D8Z	Rapid Prototyping Program	04		137,349	179,189	U
103	0604341D8Z	Defense Innovation Unit (DIU) Prototyping	04		16,178	24,402	U
104	0604400D8Z	Department of Defense (DoD) Unmanned System Common Development	04		7,762	2,691	U

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Appropriation: 0400D Research, Development, Test & Eval, DW

Line	Program Element No Number	Item Item	Act Act	FY 2021 (Base + OCO)	FY 2022 Less Supplementals Enactment	FY 2022 Division B Division C P.L.117-43 Enactment*	FY 2022 Division B P.L.117-70 Enactment**	FY 2022 Division A P.L. 117-86 Enactment***	FY 2022 Division N P.L. 117-103 Enactment****	S e c
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106	0604555D8Z	Operational Energy Capability Improvement - Non S&T	04		23,069					U
108	0604682D8Z	Wargaming and Support for Strategic Analysis (SSA)	04	3,341	3,409					U
119	0303191D8Z	Joint Electromagnetic Technology (JET) Program	04	997						U
	Advanced Component Development & Prototypes			1,998,000	2,273,771					
124	0604123D8Z	Chief Digital and Artificial Intelligence Officer (CDAO) - Dem/Val Activities	05							U
125	0604161D8Z	Nuclear and Conventional Physical Security Equipment RDT&E SDD	05	7,045	5,650					U
126	0604165D8Z	Prompt Global Strike Capability Development	05	89,156						U
128	0604771D8Z	Joint Tactical Information Distribution System (JTIDS)	05	49,458	21,292					U
132	0605022D8Z	Defense Exportability Program	05	12,649	5,416					U
133	0605027D8Z	OUSD(C) IT Development Initiatives	05	9,883	16,892					U
135	0605075D8Z	CMO Policy and Integration	05	1,295						U
138	0605210D8Z	Defense-Wide Electronic Procurement Capabilities	05	7,970	7,108					U
139	0605294D8Z	Trusted & Assured Microelectronics	05	104,180	113,536					U

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Line	Program Element No Number	Item -----	Act ---	FY 2022 Total Supplemental Enactment -----	FY 2022 Total Enactment -----	FY 2023 Request -----	S e c -
106	0604555D8Z	Operational Energy Capability Improvement - Non S&T	04		23,069	45,779	U
108	0604682D8Z	Wargaming and Support for Strategic Analysis (SSA)	04		3,409	3,229	U
119	0303191D8Z	Joint Electromagnetic Technology (JET) Program	04				U
	Advanced Component Development & Prototypes				2,273,771	2,605,675	
124	0604123D8Z	Chief Digital and Artificial Intelligence Officer (CDAO) - Dem/Val Activities	05			273,340	U
125	0604161D8Z	Nuclear and Conventional Physical Security Equipment RDT&E SDD	05		5,650	6,482	U
126	0604165D8Z	Prompt Global Strike Capability Development	05				U
128	0604771D8Z	Joint Tactical Information Distribution System (JTIDS)	05		21,292	9,120	U
132	0605022D8Z	Defense Exportability Program	05		5,416	10,145	U
133	0605027D8Z	OUSD(C) IT Development Initiatives	05		16,892	5,938	U
135	0605075D8Z	CMO Policy and Integration	05				U
138	0605210D8Z	Defense-Wide Electronic Procurement Capabilities	05		7,108	6,949	U
139	0605294D8Z	Trusted & Assured Microelectronics	05		113,536	302,963	U

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140	0605772D8Z	Nuclear Command, Control, & Communications	05	3,547	3,969					U
141	0305304D8Z	DoD Enterprise Energy Information Management (EEIM)	05	3,152	2,214					U
142	0305310D8Z	CWMD Systems: System Development and Demonstration	05	19,817	20,132					U
		System Development & Demonstration		308,152	196,209					
144	0604774D8Z	Defense Readiness Reporting System (DRRS)	06	9,586	7,167					U
145	0604875D8Z	Joint Systems Architecture Development	06	8,180	7,815					U
146	0604940D8Z	Central Test and Evaluation Investment Development (CTEIP)	06	407,678	994,151					U
147	0604942D8Z	Assessments and Evaluations	06	18,296	17,879					U
149	0605100D8Z	Joint Mission Environment Test Capability (JMETC)	06	76,146	71,410					U
151	0605128D8Z	Classified Program USD(P)	06	110,000	108,112					U
152	0605142D8Z	Systems Engineering	06	44,168	39,904					U
153	0605151D8Z	Studies and Analysis Support - OSD	06	6,720	4,612					U
154	0605161D8Z	Nuclear Matters-Physical Security	06	16,013	14,348					U
155	0605170D8Z	Support to Networks and Information Integration	06	9,230	4,759					U

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140	0605772D8Z	Nuclear Command, Control, & Communications	05		3,969	3,758	U
141	0305304D8Z	DoD Enterprise Energy Information Management (EEIM)	05		2,214	8,121	U
142	0305310D8Z	CWMD Systems: System Development and Demonstration	05		20,132	16,048	U
	System Development & Demonstration				196,209	642,864	
144	0604774D8Z	Defense Readiness Reporting System (DRRS)	06		7,167	8,902	U
145	0604875D8Z	Joint Systems Architecture Development	06		7,815	6,610	U
146	0604940D8Z	Central Test and Evaluation Investment Development (CTEIP)	06		994,151	819,358	U
147	0604942D8Z	Assessments and Evaluations	06		17,879	4,607	U
149	0605100D8Z	Joint Mission Environment Test Capability (JMETC)	06		71,410	126,079	U
151	0605128D8Z	Classified Program USD(P)	06		108,112		U
152	0605142D8Z	Systems Engineering	06		39,904	39,009	U
153	0605151D8Z	Studies and Analysis Support - OSD	06		4,612	5,716	U
154	0605161D8Z	Nuclear Matters-Physical Security	06		14,348	15,379	U
155	0605170D8Z	Support to Networks and Information Integration	06		4,759	9,449	U

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156	0605200D8Z	General Support to OUSD(Intelligence and Security)	06	7,904	10,452					U
161	0605502D8Z	Small Business Innovative Research	06	156,944						U
165	0605790D8Z	Small Business Innovation Research (SBIR)/ Small Business Technology Transfer	06	3,582	3,628					U
166	0605797D8Z	Maintaining Technology Advantage	06	24,735	26,807					U
167	0605798D8Z	Defense Technology Analysis	06	22,544	35,149					U
170	0605804D8Z	Development Test and Evaluation	06	26,240	27,280					U
173	0606100D8Z	Budget and Program Assessments	06	10,729	13,994					U
174	0606114D8Z	Analysis Working Group (AWG) Support	06							U
175	0606135D8Z	Chief Digital and Artificial Intelligence Officer (CDAO) Activities	06							U
176	0606225D8Z	ODNA Technology and Resource Analysis	06	3,200	4,897					U
177	0606300D8Z	Defense Science Board	06							U
179	0606771D8Z	Cyber Resiliency and Cybersecurity Policy	06		31,460					U
181	0203345D8Z	Defense Operations Security Initiative (DOSI)	06	2,985	2,925					U

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156	0605200D8Z	General Support to OUSD(Intelligence and Security)	06		10,452	6,112	U
161	0605502D8Z	Small Business Innovative Research	06				U
165	0605790D8Z	Small Business Innovation Research (SBIR)/ Small Business Technology Transfer	06		3,628	3,820	U
166	0605797D8Z	Maintaining Technology Advantage	06		26,807	35,414	U
167	0605798D8Z	Defense Technology Analysis	06		35,149	56,114	U
170	0605804D8Z	Development Test and Evaluation	06		27,280	26,652	U
173	0606100D8Z	Budget and Program Assessments	06		13,994	15,244	U
174	0606114D8Z	Analysis Working Group (AWG) Support	06			4,700	U
175	0606135D8Z	Chief Digital and Artificial Intelligence Officer (CDAO) Activities	06			13,132	U
176	0606225D8Z	ODNA Technology and Resource Analysis	06		4,897	3,323	U
177	0606300D8Z	Defense Science Board	06			2,532	U
179	0606771D8Z	Cyber Resiliency and Cybersecurity Policy	06		31,460	32,306	U
181	0203345D8Z	Defense Operations Security Initiative (DOSI)	06		2,925	3,034	U

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188	0303260D8Z	Defense Military Deception Program Office (DMDPO)	06	984	850					U
		Management Support		965,864	1,427,599					
200	0607210D8Z	Industrial Base Analysis and Sustainment Support	07	170,207	335,410					U
201	0607310D8Z	CWMD Systems: Operational Systems Development	07	16,332	18,616					U
213	0303140D8Z	Information Systems Security Program	07	46,529	69,191					U
223	0303767D8Z	AMBIT - Pre-Auctioned SRF	07	15,420						U
226	0305104D8Z	Defense Industrial Base (DIB) Cyber Security Initiative	07							U
234	0305172D8Z	Combined Advanced Applications	07							U
237	0305186D8Z	Policy R&D Programs	07	6,322	4,591					U
238	0305199D8Z	Net Centricity	07	20,994	13,132					U
246	0305245D8Z	Intelligence Capabilities and Innovation Investments	07		60,000					U
249	0305387D8Z	Homeland Defense Technology Transfer Program	07	2,140	1,273					U
		Operational Systems Development		277,944	502,213					
275	0608648D8Z	Acquisition Visibility - Software Pilot Program	08	16,220	18,204					U

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*Includes enacted funding pursuant to the Extending Government Funding and Delivering Emergency Assistance Act (Public Law 117-43).

**Includes enacted funding pursuant to the Further Extending Government Funding Act (Public Law 117-70).

***Includes enacted funding pursuant to the Further Additional Extending Government Funding Act (Public Law 117-86).

****Includes enacted funding pursuant to the Ukraine Supplemental Appropriations Act (Public Law 117-103).

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Office of Secretary of Defense
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
Total Obligational Authority
(Dollars in Thousands)

07 Apr 2022

Appropriation: 0400D Research, Development, Test & Eval, DW

Line	Program Element No Number	Item -----	Act ---	FY 2022 Total Supplemental Enactment -----	FY 2022 Total Enactment -----	FY 2023 Request -----	S e c -
188	0303260D8Z	Defense Military Deception Program Office (DMDPO)	06		850		U
		Management Support			1,427,599	1,237,492	
200	0607210D8Z	Industrial Base Analysis and Sustainment Support	07		335,410	588,094	U
201	0607310D8Z	CWMD Systems: Operational Systems Development	07		18,616	15,427	U
213	0303140D8Z	Information Systems Security Program	07		69,191	43,135	U
223	0303767D8Z	AMBIT - Pre-Auctioned SRF	07				U
226	0305104D8Z	Defense Industrial Base (DIB) Cyber Security Initiative	07			10,000	U
234	0305172D8Z	Combined Advanced Applications	07			49,380	U
237	0305186D8Z	Policy R&D Programs	07		4,591	6,214	U
238	0305199D8Z	Net Centricity	07		13,132	17,917	U
246	0305245D8Z	Intelligence Capabilities and Innovation Investments	07		60,000	4,575	U
249	0305387D8Z	Homeland Defense Technology Transfer Program	07		1,273	1,864	U
		Operational Systems Development			502,213	736,606	
275	0608648D8Z	Acquisition Visibility - Software Pilot Program	08		18,204	17,123	U

R-123PBP: FY 2023 President's Budget (Total Base Published Version), as of April 7, 2022 at 10:04:04

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Office of Secretary of Defense
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
Total Obligational Authority
(Dollars in Thousands)

07 Apr 2022

Appropriation: 0400D Research, Development, Test & Eval, DW

Line	Program Element No Number	Item	Act	FY 2021 (Base + OCO)	FY 2022 Less Supplementals Enactment	FY 2022 Division B Division C P.L.117-43 Enactment*	FY 2022 Division B P.L.117-70 Enactment**	FY 2022 Division A P.L. 117-86 Enactment***	FY 2022 Division N P.L. 117-103 Enactment****	S e c
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276	0608775D8Z	Accelerate the Procurement and Fielding of Innovative Technologies (APFIT)	08							U
281	0308588D8Z	Algorithmic Warfare Cross Functional Teams - Software Pilot Program	08	229,943	247,452				27,900	U
		Software And Digital Technology Pilot Programs		246,163	265,656				27,900	
				5,593,632	7,030,733				27,900	
		Total Office of Secretary of Defense								

R-123PBP: FY 2023 President's Budget (Total Base Published Version), as of April 7, 2022 at 10:04:04

*Includes enacted funding pursuant to the Extending Government Funding and Delivering Emergency Assistance Act (Public Law 117-43).

**Includes enacted funding pursuant to the Further Extending Government Funding Act (Public Law 117-70).

***Includes enacted funding pursuant to the Further Additional Extending Government Funding Act (Public Law 117-86).

****Includes enacted funding pursuant to the Ukraine Supplemental Appropriations Act (Public Law 117-103).

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Office of Secretary of Defense
FY 2023 President's Budget
Exhibit R-1 FY 2023 President's Budget
Total Obligational Authority
(Dollars in Thousands)

07 Apr 2022

Appropriation: 0400D Research, Development, Test & Eval, DW

Line	Program Element No Number	Item -----	Act ---	FY 2022 Total Supplemental Enactment -----	FY 2022 Total Enactment -----	FY 2023 Request -----	S e c -
276	0608775D8Z	Accelerate the Procurement and Fielding of Innovative Technologies (APFIT)	08			100,000	U
281	0308588D8Z	Algorithmic Warfare Cross Functional Teams - Software Pilot Program	08	27,900	275,352		U
	Software And Digital Technology Pilot Programs			----- 27,900	----- 293,556	----- 117,123	
Total Office of Secretary of Defense				----- 27,900	----- 7,058,633	----- 7,578,029	

R-123PBP: FY 2023 President's Budget (Total Base Published Version), as of April 7, 2022 at 10:04:04

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6	01	0601120D8Z	National Defense Education Program (NDEP).....	Volume 3 - 19
7	01	0601228D8Z	Historically Black Colleges and Universities and Minority-Serving Institutions.....	Volume 3 - 27

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12	02	0602128D8Z	Promotion and Protection Strategies.....	Volume 3 - 43
14	02	0602230D8Z	Defense Technology Innovation (Beyond 5G).....	Volume 3 - 47
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32	03	0603133D8Z	Foreign Comparative Testing.....	Volume 3 - 143
38	03	0603183D8Z	Joint Hypersonic Technology Development & Transition.....	Volume 3 - 167
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42	03	0603288D8Z	Science and Technology (S&T) Analytic Assessments.....	Volume 3 - 181
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176	06	0606225D8Z	ODNA Technology & Resource Analysis.....	Volume 3 - 935
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179	06	0606771D8Z	Cyber Resiliency & Cybersecurity Policy.....	Volume 3 - 943
181	06	0203345D8Z	Defense Operations Security Initiative (DOSI).....	Volume 3 - 951
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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 1: Basic Research</i>	PE 0601108D8Z / <i>High Energy Laser Research Initiatives</i>											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	20.342	16.257	0.000	16.257	16.616	16.953	17.301	17.647	Continuing	Continuing
108: <i>Joint Directed Energy Basic Research</i>	0.000	0.000	20.342	16.257	0.000	16.257	16.616	16.953	17.301	17.647	Continuing	Continuing

Note

New Start (Y/N): No

In order to better align resources and program management to functional, organizational sponsorship, the High Energy Laser Research Initiatives program has transferred from the Air Force (PE 0601108F) to the Office of the Secretary of Defense in FY 2022. This Program will focus on fundamental science supporting future Directed Energy (DE) technologies divided into DE Sources, and Beam Control and Propagation.

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Defend the Homeland, Deter Aggression and Prevail in Conflict, and Build Sustainable and Long-Term Advantage.

This program funds basic research aimed at developing fundamental scientific knowledge to support future Department of Defense Directed Energy weapon systems through the Joint Directed Energy Transition Office. This program funds multi-disciplinary research institutes to conduct research on laser, laser beam control and high power microwave technologies. In addition, this program supports research grants to stimulate student interest in directed energy and encourage graduate research in topics related to high energy lasers and high power microwaves. Efforts in this program have been coordinated through the Department of Defense Science and Technology Executive Committee process to harmonize efforts and eliminate duplication.

This program is in Budget Activity 1, Basic Research, because this budget activity includes scientific study and experimentation directed toward increasing fundamental knowledge and understanding in those fields of the physical, engineering, environmental, and life sciences related to long-term national security needs.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 1: Basic Research</i>	R-1 Program Element (Number/Name) PE 0601108D8Z I <i>High Energy Laser Research Initiatives</i>
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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	15.390	0.000	0.000	0.000
Current President's Budget	0.000	20.342	16.257	0.000	16.257
Total Adjustments	0.000	4.952	16.257	0.000	16.257
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	5.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• FFRDC	-	-0.048	-	-	-
• Adjustments to Budget Year	-	-	15.696	-	15.696
• Economic Assumption	-	-	0.561	-	0.561

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 108: *Joint Directed Energy Basic Research*

Congressional Add: *High Energy Laser Research*

Congressional Add Subtotals for Project: 108

Congressional Add Totals for all Projects

FY 2021	FY 2022
-	5.000
-	5.000
-	5.000

Change Summary Explanation

FY 2022 funding increase reflects a Congressional add for \$5.000 million for High Energy Laser Research.

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 1					R-1 Program Element (Number/Name) PE 0601108D8Z / High Energy Laser Research Initiatives				Project (Number/Name) 108 / Joint Directed Energy Basic Research			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
108: Joint Directed Energy Basic Research	0.000	0.000	20.342	16.257	0.000	16.257	16.616	16.953	17.301	17.647	Continuing	Continuing
Note In order to better align resources and program management to functional, organizational sponsorship, the High Energy Laser Research Initiatives program has transferred from the Air Force (PE 0601108F) to the Office of the Secretary of Defense in FY 2022. This Program will focus on fundamental science supporting future Directed Energy (DE) technologies divided into DE Sources, and Beam Control and Propagation.												
A. Mission Description and Budget Item Justification This program funds basic research aimed at developing fundamental scientific knowledge to support future Department of Defense Directed Energy weapon systems through the Joint Directed Energy Transition Office. This program funds multi-disciplinary research institutes to conduct research on laser, laser beam control and high power microwave technologies. In addition, this program supports research grants to stimulate student interest in directed energy and encourage graduate research in topics related to high energy lasers and high power microwaves. Efforts in this program have been coordinated through the Department of Defense Science and Technology Executive Committee process to harmonize efforts and eliminate duplication. This program is in Budget Activity 1, Basic Research, because this budget activity includes scientific study and experimentation directed toward increasing fundamental knowledge and understanding in those fields of the physical, engineering, environmental, and life sciences related to long-term national security needs.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: Directed Energy Sources									-	7.716	8.409	
Description: Improve the fundamental understanding and modeling of high energy laser and high power microwave sources and devices.												
FY 2022 Plans: Investigate innovative laser technologies, in diode-pumped lasers, fiber, and solid state laser technologies. Monitor overseas efforts to leverage international technology advancements. Investigate innovative high power laser technologies. Investigate innovative microwave technologies, in microwave sources, antennas, and related microwave component technologies. Continue overseas efforts to leverage international microwave technology advancements. Investigate innovative high power microwave technologies.												
FY 2023 Plans:												

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 1		R-1 Program Element (Number/Name) PE 0601108D8Z / High Energy Laser Research Initiatives	Project (Number/Name) 108 / Joint Directed Energy Basic Research		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Continue the investigation into innovative laser technologies, in diode-pumped lasers, fiber, and solid state laser technologies. Monitor national and international efforts to leverage technology advancements. Investigate innovative high-power laser technologies.					
Investigate innovative microwave technologies, in microwave sources, antennas, and related microwave component technologies. Continue overseas efforts to leverage international microwave technology advancements. Continue the investigation into innovative high power microwave technologies.					
FY 2022 to FY 2023 Increase/Decrease Statement: Resourcing level increase due to budget fluctuations.					
Title: Beam Control and Propagation					
Description: Improve the fundamental understanding and modeling of beam control technologies as they relate to high energy laser applications and high power microwaves. Conduct research in atmospheric characterization, metrology, control systems, algorithms, waveguides, antennas and beam control component technology.					
FY 2022 Plans: Conduct research of innovative high energy laser beam control architectures. Leverage international research developments and technology advancements where possible.					
FY 2023 Plans: Initiate new research of innovative high energy laser beam control and high power microwave antenna architectures. Leverage international research developments and technology advancements where possible.					
FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.					
Accomplishments/Planned Programs Subtotals			-	7.626	7.848
			FY 2021	FY 2022	
Congressional Add: High Energy Laser Research			-	5.000	
FY 2022 Plans: Funds will be used to establish a DE Center of Excellence under the Joint DE Transition Office to conduct basic research in high energy lasers and high power microwaves.					
Congressional Adds Subtotals			-	5.000	

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 1	R-1 Program Element (Number/Name) PE 0601108D8Z / <i>High Energy Laser Research Initiatives</i>	Project (Number/Name) 108 / <i>Joint Directed Energy Basic Research</i>
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks NA		
D. Acquisition Strategy NA		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 1: Basic Research</i>					PE 0601110D8Z / <i>Basic Research Initiatives</i>							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	72.992	76.702	62.386	0.000	62.386	63.847	64.948	65.984	67.228	Continuing	Continuing
010: <i>Basic Research Initiatives</i>	-	42.469	30.854	11.644	0.000	11.644	11.846	12.054	12.148	12.388	Continuing	Continuing
016: <i>Minerva Research Initiative</i>	-	0.000	14.000	17.143	0.000	17.143	17.402	17.602	17.802	18.085	Continuing	Continuing
060: <i>Vannevar Bush Faculty Fellowship</i>	-	30.523	31.848	33.599	0.000	33.599	34.599	35.292	36.034	36.755	Continuing	Continuing

Note

New Start (Y/N): No

In FY 2022, the Minerva Research Initiative was realigned within PE 0601110D8Z from Project Code 010 to new Project Code 016.

A. Mission Description and Budget Item Justification

Basic research provides the Department of Defense (DoD) with a deep and broad awareness of current directions in areas of research important to U.S. military capabilities – including physics and the physical sciences, materials science, chemistry and chemical engineering, electrical engineering, mathematics, computer science, mechanical and aerodynamic engineering, ocean sciences, biological sciences, and the social sciences, among others. Basic research sustains scientific and engineering communities as it generates the critical technical knowledge underpinnings of DoD capabilities. Basic research allows exploration and discovery, yielding disruptive non-incremental advances that can improve or radically change military capabilities, strategy, and operations.

The Basic Research Initiatives program element (PE) supports the defense basic research enterprise in three critical areas: Strategic Support for Basic Research (SSBR), the Minerva Research Initiative (MRI), and the Vannevar Bush Faculty Fellowship (VBFF) Program.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022		
Appropriation/Budget Activity		R-1 Program Element (Number/Name)				
0400: Research, Development, Test & Evaluation, Defense-Wide / BA 1: Basic Research		PE 0601110D8Z / Basic Research Initiatives				
B. Program Change Summary (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget		75.542	39.828	0.000	0.000	0.000
Current President's Budget		72.992	76.702	62.386	0.000	62.386
Total Adjustments		-2.550	36.874	62.386	0.000	62.386
• Congressional General Reductions		-	-			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-	-			
• Congressional Adds		-	37.000			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-2.536	-			
• Other Reprogramming		-0.014	-	-	-	-
• FFRDC		-	-0.126	-	-	-
• Adjustments to Budget Year		-	-	47.684	-	47.684
• Economic Assumption		-	-	1.702	-	1.702
• Re-Baselining and Reconstitution for Minerva		-	-	13.000	-	13.000
Congressional Add Details (\$ in Millions, and Includes General Reductions)						
Project: 010: Basic Research Initiatives						
Congressional Add: Minerva Research Initiative						
Congressional Add: Defense Experimental Program to Stimulate Competitive Research (DEPSCoR)						
Congressional Add: National Consortium for the Study of Terrorism and Responses to Terrorism (START)						
Congressional Add: National Academy of Science (NAS) Study on Confucius Centers						
Congressional Add: Asymmetric Threat Analysis						
Congressional Add Subtotals for Project: 010						
Project: 016: Minerva Research Initiative						
Congressional Add: Minerva Research Initiative						
Congressional Add Subtotals for Project: 016						
Congressional Add Totals for all Projects						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 1: Basic Research	R-1 Program Element (Number/Name) PE 0601110D8Z / Basic Research Initiatives	
<p>Change Summary Explanation</p> <p>FY 2022 Appropriation includes Congressional Adds, as follows:</p> <p>\$8.000 million - asymmetric threat analysis</p> <p>\$10.000 million - Minerva</p> <p>\$19.000 million - DEPSCOR</p> <p>FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 1					R-1 Program Element (Number/Name) PE 0601110D8Z / Basic Research Initiatives				Project (Number/Name) 010 / Basic Research Initiatives			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
010: Basic Research Initiatives	-	42.469	30.854	11.644	0.000	11.644	11.846	12.054	12.148	12.388	Continuing	Continuing

Note

In FY 2022, the Minerva Research Initiative was realigned within PE 0601110D8Z from Project Code 010 to new Project Code 016.

A. Mission Description and Budget Item Justification

The Basic Research Initiatives project, Project Code 010, includes Strategic Support for Basic Research (SSBR) and the Minerva Research Initiative.

SSBR supports oversight, policies, and initiatives to create conditions that allow defense basic research investments to produce high-payoff, transformative scientific breakthroughs for the Department, which can open new approaches of technology dominance and mastery of new domains of warfare. SSBR initiatives support the five Basic Research Office strategic goals: (1) support the modernization priorities set by the Office of the Secretary of Defense (OSD); (2) coordinate and conduct oversight of DoD basic research programs; (3) improve the science and engineering workforce and public outreach; (4) enhance university-industry collaboration; and (5) engage with the academic research community and international partners.

The Minerva Research Initiative, a DoD basic research program in the social sciences directed by the Office of the Secretary of Defense (OSD), funded in partnership with Air Force and Navy University Research Initiatives and executed by the Office of Naval Research (ONR) and the Air Force Office of Scientific Research (AFOSR), seeks to build a fundamental understanding of the sources of present and future conflict.

FY 2020 was the last year of funding requested for the Minerva Research Initiative in this Project Code. In FY 2021, the program received a \$17.000 million Congressional increase in support of Minerva efforts. Beginning in FY 2022, Minerva efforts will be funded under separate Project Code 016.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Strategic Support for Basic Research (SSBR)	4.190	3.854	4.644
Description: SSBR supports oversight, policies, and initiatives to create conditions that allow defense basic research investments to produce high-payoff, transformative scientific breakthroughs for the Department, which can open new approaches of technology dominance and mastery of new domains of warfare. SSBR initiatives support the five Basic Research Office strategic goals: (1) support the modernization priorities set by the Office of the Secretary of Defense (OSD); (2) coordinate and conduct oversight of DoD basic research programs; (3) improve the science and engineering workforce and public outreach; (4) enhance university-industry collaboration; and (5) engage with the academic research community and international partners.			
FY 2022 Plans: Plans for FY 2022 are similar in type and scope to those of FY 2021. The Bush Fellows Research Study Team (BFRST) program will award a new class of fellows, selected from active Vannevar Bush Faculty Fellowships (VBFF) classes, according to the			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 1		R-1 Program Element (Number/Name) PE 0601110D8Z / Basic Research Initiatives	Project (Number/Name) 010 / Basic Research Initiatives		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
critical priorities of the Department. The impact of current programs on nation-wide engineering and manufacturing capabilities of the future will be assessed. FY 2023 Plans: Plans for FY 2023 are similar in type and scope to those of FY 2022. In addition to continuing the BFRST program, the Basic Research Office will conduct a series of workshops aimed at generating cross-agency strategies to enhance university-government-industry collaborations, as well as with our international partners. FY 2022 to FY 2023 Increase/Decrease Statement: Changes reflect minor budget fluctuations.					
Title: Vannevar Bush Faculty Fellowship (VBFF) Program Description: The VBFF Program ensures the DoD has a research portfolio that supports highly creative, innovative, and productive university researchers. The objectives of the program are to: (1) support scientific research that may lead to extraordinary outcomes of relevance to the DoD; (2) educate and train students and post-doctoral researchers for the defense and national security workforce; (3) foster long-term relationships between university researchers and the Department; (4) familiarize select university researchers and their students with DoD's current and future challenges through research and engagement with DoD-employed scientists; and (5) increase the number of exceptionally talented technical experts contributing to the DoD's mission. FY 2023 Plans: The FY 2023 budget will allow restoration of a robust and consistent LUCI program (currently, the program can only fund one set of awards every other year), with a class size that is consistent with the program initiation levels and the opportunities provided by the DoD's S&T workforce for innovative and transitional ideas. The second and smaller scope extension allows the funding of a VBFF class size that is also consistent with the number of high-level, highly worthy proposals submitted by world-class investigators at U.S. universities (from 8 to 9 or 10, depending on the quality of proposals). FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 funding for the Vannevar Bush Faculty Fellowship Program is in project 060. The FY 2023 funding request of \$7.000 million will be administratively realigned to project 060 during the year of execution.			-	-	7.000
Accomplishments/Planned Programs Subtotals			4.190	3.854	11.644
			FY 2021	FY 2022	
Congressional Add: Minerva Research Initiative			16.268	-	
FY 2021 Accomplishments: In addition to supporting ongoing awards, Minerva will make new awards received in the FY 2021 Funding Opportunity Announcement (FOA) competition, expand the Defense Education and					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 1	R-1 Program Element (Number/Name) PE 0601110D8Z / <i>Basic Research Initiatives</i>	Project (Number/Name) 010 / <i>Basic Research Initiatives</i>	
		FY 2021	FY 2022
Civilian University Research (DECUR) Partnership, and continue to support the Minerva-United States Institute of Peace (USIP) advanced graduate students, developing future researchers working on DoD problems.			
Congressional Add: Defense Experimental Program to Stimulate Competitive Research (DEPSCoR) FY 2021 Accomplishments: DEPSCoR will continue to build on the program started in FY 2019 to expand the DoD research landscape in states that have traditionally not received large quantities of DoD funds, enhancing the capabilities of institutions of higher education and increasing the number of researchers responsive to DoD needs. The program will include a stand-alone DEPSCoR competition which will provide support for at least 20 new basic research grants, outreach to research institutions that have less engagement with the Department by conducting a virtual DEPSCoR-day and up to two outreach events around the country, and support for university capacity building activities in DoD relevant fields. FY 2022 Plans: Continue and expand efforts to connect academic researchers in underrepresented states to DoD research problems. The increased funding for DEPSCoR will allow the Department to reach more universities and researchers capable of performing DoD research, and allow for more awards for both research collaborations and capacity building opportunities.		16.011	19.000
Congressional Add: National Consortium for the Study of Terrorism and Responses to Terrorism (START) FY 2021 Accomplishments: As guided by conversations with Congressional authorizers and appropriators, the National Consortium for the Study of Terrorism and Responses to Terrorism (START) funds will be used to support maintenance and ongoing work on START-maintained datasets, including the Global Terrorism Database. Remaining funds will support 6.1 research on Irregular Warfare problem sets, as informed through conversations with the needs of the Joint Special Operations University and the Special Operations Forces (SOF) community.		5.000	-
Congressional Add: National Academy of Science (NAS) Study on Confucius Centers FY 2021 Accomplishments: The Defense Authorization Act for Fiscal Year 2021 contained a requirement that the Department cease funding (by October 1, 2023) for institutions of higher education (for purposes other than direct support to students for education) that are host to Confucius Institutes. The congressional add will be used to provide funding to the National Academies of Sciences, Engineering, and Medicine (NASEM) to study the impacts of Confucius Institutes on the defense-funded academic research enterprise and to fulfill the Congressional requirement to consult with NASEM before deciding whether to provide waivers for academic institutions hosting Confucius Institutes beyond October 1, 2023. The Basic Research Office is working with other stakeholders within OUSD(R&E) to develop an effective study plan. Once complete, the Basic Research Office will work with NASEM to execute the study and inform Department actions well in advance of the October		1.000	-

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400 / 1	R-1 Program Element (Number/Name) PE 0601110D8Z / <i>Basic Research Initiatives</i>	Project (Number/Name) 010 / <i>Basic Research Initiatives</i>
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	FY 2021	FY 2022
1, 2023 deadline. This study may also serve to build awareness within the academic community about the issues surrounding Confucius Institutes.		
Congressional Add: Asymmetric Threat Analysis FY 2022 Plans: The funding increase supports social science research related to asymmetric threats and the collaborative structure established with Assistant Secretary of Defense for Special Operations/Low-Intensity Conflict (Policy-SO/LIC) and Joint Special Operations University (JSOU)/United States Special Operations Command (SOCOM) to manage research on asymmetric competition, including the support of relevant datasets used widely by the research community studying asymmetric threats. This program will continue through the National Consortium for the Study of Terrorism and Responses to Terrorism (START) at the University of Maryland and its Applied Research Laboratory for Intelligence and Security (ARLIS) University-Affiliated Research Center (UARC).	-	8.000
Congressional Adds Subtotals	38.279	27.000

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 1					R-1 Program Element (Number/Name) PE 0601110D8Z / Basic Research Initiatives				Project (Number/Name) 016 / Minerva Research Initiative			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
016: Minerva Research Initiative	-	0.000	14.000	17.143	0.000	17.143	17.402	17.602	17.802	18.085	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Minerva Research Initiative includes three primary components: (1) a university-based social science basic research grant program, funded in partnership with Air Force and Navy University Research Initiatives; (2) the Defense Education and Civilian University Research (DECUR) Partnership program for professional military education (PME) institutions; and (3) a collaboration with the Congressionally-established United States Institute of Peace (USIP) to award research support to advanced graduate students and early career scholars working on security and peace. All components contribute to Minerva's goals of revitalizing connections between the DoD and academic social science communities and building cultural and foreign area knowledge on topics ranging from China-Russia great power competition, National Defense Strategy (NDS) strategic priorities, to geopolitical power projection strategies in a multi-polar world. This deeper scientific understanding will provide a more informed basis to shape doctrine, analysis, and other strategic and operational decisions made by war planners and warfighters.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Minerva Research Initiative (MRI)	-	4.000	17.143
<p>Description: The Minerva Research Initiative includes three primary components: (1) a university-based social science basic research grant program, funded in partnership with Air Force and Navy University Research Initiatives; (2) the Defense Education and Civilian University Research (DECUR) Partnership program for professional military education (PME) institutions; and (3) a collaboration with the Congressionally-established USIP to award research support to advanced graduate students and early career scholars working on security and peace. All components contribute to Minerva's goals of revitalizing connections between the DoD and academic social science communities and building cultural and foreign area knowledge on topics ranging from China-Russia great power competition, NDS strategic priorities, to geopolitical power projection strategies in a multi-polar world. This deeper scientific understanding will provide a more informed basis to shape doctrine, analysis, and other strategic and operational decisions made by war planners and warfighters.</p> <p>FY 2022 Plans: With the FY 2022 base budget, Minerva will support research on the social, cultural, behavioral, economic, and political impacts of climate and environmental change. This includes university grants and projects partnering with PME Institutions. Furthermore, the program will continue collaboration with the operational community on all issues for which it has developed expertise among the social science community; it will help implement the DoD plan for social, management, and information sciences as guided in the FY 2021 NDAA Section 220 language; and it will continue collaboration with the USIP in supporting advanced doctoral students pursuing research on DoD topics of interest.</p> <p>FY 2023 Plans: With the FY 2023 base budget, Minerva will support research on understanding the social, cultural, behavioral, economic, and political context in which DoD operates. This includes university grants and projects partnering with PME Institutions.</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 1	R-1 Program Element (Number/Name) PE 0601110D8Z / <i>Basic Research Initiatives</i>	Project (Number/Name) 016 / <i>Minerva Research Initiative</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
Furthermore, the program will continue collaboration with the operational community on all issues for which it has developed expertise among the social science community; it will help implement the DoD plan for social, management, and information sciences as guided in the FY 2021 NDAA Sec. 220 language; and it will continue collaboration with the USIP in supporting advanced doctoral students pursuing research on DoD topics of interest.			
FY 2022 to FY 2023 Increase/Decrease Statement: Office of the Secretary of Defense (OSD) Re-Baselining and Reconstitution for Minerva.			
Accomplishments/Planned Programs Subtotals		-	4.000
		FY 2021	FY 2022
Congressional Add: Minerva Research Initiative		-	10.000
FY 2022 Plans: Increase continuity in social science research and allow additional focus on social science research in the National Defense Strategy priority areas. Funding will allow for topics other than climate change to be included in the next Minerva solicitation.			
Congressional Adds Subtotals		-	10.000
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 1					R-1 Program Element (Number/Name) PE 0601110D8Z / Basic Research Initiatives				Project (Number/Name) 060 / Vannevar Bush Faculty Fellowship			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
060: Vannevar Bush Faculty Fellowship	-	30.523	31.848	33.599	0.000	33.599	34.599	35.292	36.034	36.755	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Vannevar Bush Faculty Fellowship (VBFF) program supports world-class researchers in scientific areas of critical importance to the DoD and ensures the cultivation of exceptional talent. Fellows' research spans a broad set of emerging scientific areas with transformative potential, including Quantum Information Science, Novel Engineered Materials, Cognitive Neuroscience and human-machine interfaces, Engineering Biology, Applied and Computational Mathematics, Networks, Machine Learning and Artificial Intelligence, Manufacturing Science, and others. The program delivers the most innovative and transformational scientific ideas of relevance to the DoD, from the top scientists in the Nation. The program fosters close connections between academia and the defense science and engineering (S&E) enterprise, a primary goal of Strategic Support for Basic Research (SSBR) efforts. Fellows provide the Department the deep scientific expertise from today's leading research universities and collaborate with defense scientists and engineers. This program actively engages and coordinates basic research across the Department.

The project includes support for the Laboratory-University Collaboration Initiative (LUCI) program, which is designed to team scientists in the DoD laboratories with top academic researchers from the programs sponsored or overseen by the Office of the Secretary of Defense (in particular, the VBFF fellows), in order to collaboratively perform basic research on a topic of their choice. Three-year grants allow a deep exchange of ideas between academic and DoD research communities, bring the most recent scientific breakthroughs closer to DoD relevance, and greatly expand the skills and knowledge of the S&E workforce within the laboratories.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Vannevar Bush Faculty Fellowship (VBFF) Program	30.523	31.848	33.599
Description: The VBFF Program ensures the DoD has a research portfolio that supports highly creative, innovative, and productive university researchers. The objectives of the program are to: (1) support scientific research that may lead to extraordinary outcomes of relevance to the DoD; (2) educate and train students and post-doctoral researchers for the defense and national security workforce; (3) foster long-term relationships between university researchers and the Department; (4) familiarize select university researchers and their students with DoD's current and future challenges through research and engagement with DoD-employed scientists; and (5) increase the number of exceptionally talented technical experts contributing to the DoD's mission.			
FY 2022 Plans: Plans for FY 2022 are similar in type and scope to those of FY 2021. The VBFF and LUCI class sizes will gradually increase, pending sufficient quality of proposals. Program reviews will be held. The scientific topics of interest will be re-examined and the Funding Opportunity Announcement (FOA) updated accordingly.			
FY 2023 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 1	R-1 Program Element (Number/Name) PE 0601110D8Z / <i>Basic Research Initiatives</i>	Project (Number/Name) 060 / <i>Vannevar Bush Faculty Fellowship</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>Plans for FY 2023 are similar in type to those of FY 2022, but expanded in scope due to the budget increase. As a first priority, the FY 2023 budget will allow restoration of a robust and consistent LUCI program (currently, the program can only fund one set of awards every other year), with a class size that is consistent with the program initiation levels and the opportunities provided by the DoD's S&T workforce for innovative and transitional ideas. The second and smaller scope extension allows the funding of a VBFF class size that is also consistent with the number of high-level, highly worthy proposals submitted by world-class investigators at U.S. universities (from 8 to 9 or 10, depending on the quality of proposals).</p> <p>Funding in the amount of \$7.000 million will be administratively realigned from project 010 to project 060 in FY 2023 for the Vannevar Bush Faculty Fellowship Program.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> The increase from FY 2022 to FY 2023 will support the increase in class size for VBFF and LUCI programs.</p>			
Accomplishments/Planned Programs Subtotals		30.523	31.848
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: Research, Development, Test & Evaluation, Defense-Wide / BA 1: Basic Research					PE 0601120D8Z / National Defense Education Program (NDEP)							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	132.522	144.841	132.347	-	132.347	142.716	149.913	155.667	158.781	-	-
120: National Defense Education Program (NDEP)	-	132.522	144.841	132.347	-	132.347	142.716	149.913	155.667	158.781	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Build Sustainable and Long-Term Advantage, and Taking Care of People.

The National Defense Education Program (NDEP) fosters and enhances the Department of Defense's (DoD) ability to develop and access high-quality science, technology, engineering, and mathematics (STEM) talent vital to national defense, now and in the future. The NDEP is executed by the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)). Aligned to the Federal STEM Strategy, the NDEP addresses critical STEM education and talent development challenges using a continuous learning structure and evidence-based approaches. Specifically, the NDEP is part of the broader Department-wide effort under DoD STEM, which works collectively with partners from academia, industry non-profit organizations, defense laboratories, and other government entities to: (1) build strong foundations for STEM literacy; (2) increase diversity, equity, and inclusion in STEM; and (3) prepare the STEM workforce of the future. The DoD STEM and NDEP activities engage in assessment and evaluation practices as outlined by the Office of Management and Budget and the Government Accountability Office.

The NDEP's portfolio includes: the Science, Mathematics, and Research for Transformation (SMART) program; STEM Education and Outreach efforts including the Defense STEM Education Consortium (DSEC); and specific Congressionally directed programs, to include the Manufacturing Engineering Education Program (MEEP) and broader NDEP funding opportunities in STEM education and workforce development. NDEP activities align with the Department's vision of a diverse STEM talent pool readily accessible to serve our Nation and evolve the Department's competitive edge. The NDEP aligns to the DoD STEM Strategy in support of the National Defense Strategy and the DoD science and technology (S&T) modernization priorities.

NDEP activities further support the DoD STEM effort in providing authentic learning experiences through a variety of education and outreach initiatives in the form of scholarships, internships, enrichment activities, competitions, and mentorships by leveraging partners from industry, academia, and other government organizations with a shared STEM mission. The DoD STEM programs span across all age groups, including kindergarten through twelfth grade (K-12) students and teachers and postsecondary, undergraduate, and graduate students.

The SMART program awards highly competitive scholarships-for-service to undergraduate and graduate students in 21 STEM academic disciplines and hires the students, upon graduation, into DoD's workforce. As part of the SMART experience, scholars engage in internships that allow for relevant hands-on research and work experiences in DoD facilities, thereby enhancing their educational experience. Since its inception as a pilot program in FY 2005, SMART has awarded approximately 3,400 scholarships to students pursuing undergraduate to doctoral studies. To date, approximately 2,400 students have completed their academic pursuit and

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 1: Basic Research	R-1 Program Element (Number/Name) PE 0601120D8Z / National Defense Education Program (NDEP)
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transitioned into DoD employment with approximately 650 more currently pursuing their SMART-funded degree. Approximately 1,700 participants have successfully completed the program through their DoD Service commitment. SMART ensures the Department has a steady infusion of high-quality technical talent, prepared in areas of critical importance to DoD, and ready to apply their technical knowledge, skills, and abilities to fulfill DoD's mission.

The NDEP will continue to support the preparation of dependents of members of the armed forces for careers in STEM as enacted under 10 USC 2192(b) in FY 2020. STEM education and outreach activities and awardees through NDEP Congressional Adds will continue to engage military connected students in collaboration with the Department of Defense Education Activity (DoDEA). Additionally, where feasible, NDEP activities will also support the Supporting Veterans in STEM Careers Act, enacted in FY 2020.

STEM Education and Outreach is a multitude of cohesive and coordinated activities for PreK-16 students, teachers, and schools, especially those for underrepresented and underserved communities, to include military connected students. In March 2019, the Defense STEM Education Consortium (DSEC) was established to facilitate these efforts. The DSEC is a consortium model approach that leverages a collaborative ecosystem/partnership between academia, industry, not-for-profit organizations, and government that aims to broaden STEM literacy and develop a diverse and agile workforce to power the United States' innovative defense infrastructure. The DSEC is a five-year, \$75.000 million investment, which comprises a diverse consortium of program partners and is designed to leverage evidence-based approaches to inspire and develop the U.S. science and technology future workforce. Finally, the DSEC is designed to evolve over time and has built-in Innovation Bloc (IB) funding which allows the consortium to address emerging issues in STEM education and potential gaps within the portfolio.

The DoD consistently seeks innovative scientific and technological solutions to address current and future military requirements. The MEEP will enhance existing, or establish new education programs (or collection of programs), to better position the current and next generation manufacturing workforce to produce military systems and components that assure technological superiority for the Department. The BIOTECH Education Program will establish new educational programs that align with BIOTECH Modernization priorities.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	137.154	112.195	0.000	-	0.000
Current President's Budget	132.522	144.841	132.347	-	132.347
Total Adjustments	-4.632	32.646	132.347	-	132.347
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	33.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-4.606	-			
• Adjustments to Budget Year	-	-	127.782	-	127.782
• Other Reprogramming	-0.026	-	-	-	-
• Economic Assumption	-	-	4.565	-	4.565

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 1: Basic Research		R-1 Program Element (Number/Name) PE 0601120D8Z I National Defense Education Program (NDEP)		
• FFRDC -		-0.354 - - -		
Congressional Add Details (\$ in Millions, and Includes General Reductions)				
Project: 120: National Defense Education Program (NDEP)				
Congressional Add: Basic Research		34.913	-	
Congressional Add: Civics Education		2.000	2.000	
Congressional Add: SMART Diversification Activities		-	2.000	
Congressional Add: STEM Programs		-	14.000	
Congressional Add: Civil Society		-	15.000	
Congressional Add Subtotals for Project: 120		36.913	33.000	
Congressional Add Totals for all Projects		36.913	33.000	
Change Summary Explanation				
FY 2022 Appropriation includes Congressional Adds, as follows:				
\$2.000 million - SMART diversification activities				
\$14.000 million - STEM programs				
\$2.000 million - civics education				
\$15.000 million - civil society				
FY 2023 funding increase reflects the fact that the FY 2022 President’s Budget request did not include out-year funding.				
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Title: Workforce Development - Science, Mathematics, and Research for Transformation (SMART) Defense Education Program		74.784	88.843	103.900
Description: SMART is a scholarship-for-service program that provides support to high performing U.S. graduate and undergraduate students in 21 academic science, technology, engineering, and mathematics (STEM) disciplines identified as areas of future workforce priorities for the DoD.				
The disciplines align with the Department’s Science and Technology (S&T) priorities and emerging scientific research areas, such as: Aeronautical and Astronautical Engineering; Biomedical Engineering; Biosciences; Chemical Engineering; Chemistry; Civil Engineering; Cognitive, Neural, and Behavioral Sciences; Computer and Computational Sciences/Computer Engineering; Electrical Engineering; Environmental Sciences; Geosciences; Industrial and Systems Engineering; Information Sciences; Materials Science and Engineering; Mathematics; Mechanical Engineering; Naval Architecture and Ocean Engineering; Nuclear				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 1: Basic Research</i>		R-1 Program Element (Number/Name) PE 0601120D8Z I <i>National Defense Education Program (NDEP)</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Engineering; Oceanography; Operations Research; and Physics. Upon completion of their degree, students fulfill a service commitment to the Department on a one-to-one payback per year of education funded.</p> <p>Since FY 2005, the SMART program has awarded approximately 3,400 scholarships to scholars engaging with 211 sponsoring facilities across the entire DoD, including the Army, Navy, Air Force and other DoD agencies. Over 90% of the participants have successfully completed, or are on track to complete, both their SMART-funded degree pursuit and their DoD employment agreement.</p> <p>Oversight of the SMART program falls under the purview of Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) with execution at the Component level. Two types of individuals participate in the program: (1) retention scholars who are current DoD employees; and (2) recruitment scholars who are students enrolled in undergraduate and graduate programs and represent new technical expertise for the Department. Internships provide SMART scholars with an opportunity to engage in the DoD science and technology enterprise through research and work experiences in defense laboratories, thereby enhancing their educational experience and understanding the relevance of DoD research priority areas.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> • Continue to ensure SMART awards meet the technical needs of the Department's STEM workforce and sustain the scientific and technological superiority on the battlefield. • Continue to strengthen partnerships with Historically Black Colleges and Universities and Minority-serving Institutions (HBCU/ MIs) to increase diversity and awareness of research and STEM initiatives that meet DoD Component and Laboratory mission needs. • Conduct a SMART Symposium and grow the SMART Ambassador program and SMART Scholars Steering Committee (SSSC) to continually enhance inter-Service collaboration and provide scholars a networking forum. • Continue SMART SEED initiative to provide an opportunity to competitively award research grants to scholars who have pursued a PhD through the SMART Program and are currently in the service commitment phase of their scholarship. As future science and technology leaders within the DoD, SEED grants provide opportunities for early-career researchers to establish and lead their own basic and applied research under the mentorship of a more senior subject matter expert, while also providing networking opportunities to other related activities across the DoD. This effort aims to enhance the scholar's experience during their service commitment, and prepares awardees for long-term success as more seasoned technical experts within the DoD workforce. <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> • Award 350-400 new scholars (projected). • Implement strategic HBCU/MI initiative to increase diversity of the applicant pool and awareness of research and STEM initiatives that meet DoD Component and Laboratory mission needs and the modernization priority areas. 				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 1: Basic Research</i>		R-1 Program Element (Number/Name) PE 0601120D8Z / <i>National Defense Education Program (NDEP)</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> • Conduct an annual forum for current and prospective DoD sponsoring facilities (SFs) to highlight SMART program benefits, share best practices, and enhance technical engagement with scholars, HBCU/MIs, and OSD leadership. • Continue to optimize SMART Information Management System (SIMS) to identify process efficiencies in data collection, communication, and virtual engagement with scholars, SFs, SMART Advisory Council, program office and support staff. • Increase SEED research grant awards to scholars who have pursued a PhD through the SMART program and are currently in the service commitment phase of their scholarship. <p>FY 2022 to FY 2023 Increase/Decrease Statement: Additional funding will allow the program to increase the number of scholarships to be awarded in FY 2023 to help meet the DoD's workforce needs. The program typically awards approximately 250-300 scholarships annually. The funding increase will allow approximately 350-400 scholarships in FY 2023. Additionally, the funding increase will allow growth of the successful SMART SEED grant program for PhD scholars during their employment obligation phase, as well as provide opportunities to establish strategic partnerships aimed at broadening diversity among program applicants.</p>				
<p>Title: Science, Technology, Engineering, and Mathematics (STEM) Education and Outreach</p> <p>Description: The NDEP's STEM Education and Outreach activities provides learners and educators across the pre-K to 16+ continuum unique experiences aimed to inspire, cultivate, and develop exceptional STEM talent poised to tackle evolving defense technological challenges. In order to build a workforce that solves national defense needs and challenges, the DoD recognizes the necessity for increased participation of underserved groups in STEM activities and education programs. Investments are made to promote participation in national-level STEM programs and initiatives and provide authentic learning experiences for students and teachers across the globe. STEM Education and Outreach activities are aligned to the Department's STEM Strategic Plan, support the Federal STEM Education Strategic Plan, and enable the Department to have enduring access to STEM talent, now and into the future.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> • Continue to provide STEM Education and Outreach activities with emphasis on authentic hands-on experiences to students and teachers and evaluate the effectiveness of the increased outreach. • Continue to leverage DSEC partnerships, STEM ecosystems, and other government partnerships to amplify awareness and broaden reach. • Continue to participate in inter- and intra-departmental collaboration with stakeholders to achieve Federal and DoD STEM objectives. • Continue to expand the experience of DoD-supported STEM education and outreach opportunities to reach all populations, through consideration of the barriers faced by underserved and underrepresented populations. 		18.825	20.998	26.447

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 1: Basic Research</i>		R-1 Program Element (Number/Name) PE 0601120D8Z / <i>National Defense Education Program (NDEP)</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> Coordinate with DoD Components to develop an Implementation Plan in support of Strategic Plan. <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> Continue to provide STEM Education and Outreach activities with emphasis on authentic hands-on experiences to students and teachers and evaluate the effectiveness of the increased outreach. Continue to leverage DSEC partnerships, STEM ecosystems, and other government partnerships to amplify awareness and broaden reach. Continue to participate in inter- and intra-departmental collaboration with stakeholders to achieve Federal and DoD STEM objectives. Continue to expand the experience of DoD supported STEM education and outreach opportunities to reach all populations, through consideration of the barriers faced by underserved and underrepresented populations. Publish a five-year report on establishing baseline metrics and reporting on EAC efforts across the Department. <p>FY 2022 to FY 2023 Increase/Decrease Statement: The increase in funding will support the continuation and expansion of STEM education and outreach opportunities.</p>				
<p>Title: Biotechnology (BIOTECH) Education Program</p> <p>Description: In order to build a BIOTECH workforce that solves national defense needs and challenges, the DoD recognizes the importance of supporting domestic programs that motivate young people to pursue education and career opportunities in biotechnology.</p> <p>FY 2022 Plans: Support DoD and Federal STEM Education Strategy and Department's BIOTECH Roadmap in building biotechnology literacy, diversity and inclusion, and developing the future biotech workforce.</p> <p>FY 2023 Plans: Support DoD and Federal STEM Education Strategy and Department's BIOTECH Roadmap in building biotechnology literacy, diversity and inclusion, and developing the future biotech workforce.</p>		2.000	2.000	2.000
Accomplishments/Planned Programs Subtotals		95.609	111.841	132.347
		FY 2021	FY 2022	
Congressional Add: Basic Research		34.913	-	

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 1: Basic Research</i>		R-1 Program Element (Number/Name) PE 0601120D8Z / <i>National Defense Education Program (NDEP)</i>	
		FY 2021	FY 2022
FY 2021 Accomplishments: Published a funding opportunity announcement which seeks to expand STEM education, outreach, and workforce development programs that support the DoD and Federal STEM Education Strategic Plan.			
Congressional Add: Civics Education FY 2021 Accomplishments: Published a funding opportunity announcement to implement a pilot program on enhanced civics education in coordination with the DoD Education Activity (DoDEA) and the Junior Reserve Officer's Training Corps (JROTC), and in consultation with the Department of Education. FY 2022 Plans: Section 234 of the FY 2020 National Defense Authorization Act (NDAA) established a pilot program to enhance educational offerings that address critical thinking and media literacy; voting and other forms of political and civic engagement; understanding the U.S. law, history, and Government; and interest in employment and careers in public service. Funding will be applied to outreach activities to amplify the public's awareness of STEM careers in the Department.		2.000	2.000
Congressional Add: SMART Diversification Activities FY 2022 Plans: The program increase will support the requirements of Sections 242 and 250 of the FY 2021 NDAA and the Department's strategic goals in Diversity, Equity, Inclusion, and Accessibility. Funding will be used to increase the number of scholarship awards, establish incentivized strategic recruiting partnerships with HBCU/MIs and affinity groups, and/or support new program initiatives to support underrepresented scholars during their service commitment phase. These efforts lend to the SMART Program's strategic goal of diversifying the applicant and award pools, which will ultimately diversify the Department's technical talent needed to address critical technologies now and in the future.		-	2.000
Congressional Add: STEM Programs FY 2022 Plans: Pursue projects in partnership with organizations with an established history of providing scholarships to students pursuing an education in these fields.		-	14.000
Congressional Add: Civil Society FY 2022 Plans: Identify and work with universities with ethics and public affairs programs to promote civil society education and outreach, including among military and non-military communities.		-	15.000
Congressional Adds Subtotals		36.913	33.000
D. Other Program Funding Summary (\$ in Millions)			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 1: Basic Research</i>	R-1 Program Element (Number/Name) PE 0601120D8Z / <i>National Defense Education Program (NDEP)</i>	
D. Other Program Funding Summary (\$ in Millions)		
Remarks		
E. Acquisition Strategy N/A		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: Research, Development, Test & Evaluation, Defense-Wide / BA 1: Basic Research					PE 0601228D8Z / Historically Black Colleges and Universities and Minority-Serving Institutions							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	77.017	99.902	33.288	0.000	33.288	34.300	34.986	35.721	36.437	Continuing	Continuing
448: Historically Black Colleges and Universities and Minority-Serving Institutions	-	77.017	99.902	33.288	0.000	33.288	34.300	34.986	35.721	36.437	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program element (PE) provides support for Historically Black Colleges and Universities and Minority-Serving Institutions (HBCU/MI) in fields of science and engineering that are important to national defense. The Department of Defense (DoD) HBCU/MI program encourages participation of small minority schools as well as large minority research institutions. The program is authorized by 10 U.S.C. § 2362 and is funded by annual appropriations. This competitive program provides support through grants, cooperative agreements, or contracts for research, education assistance, and instrumentation purchases.

Work in this PE provides a foundation to enhance participation of HBCUs/MIs in DoD research. Programs are structured to: build infrastructure; strengthen research and educational opportunities at HBCUs/MIs and increase the number of minority graduates in the science, technology, engineering, and mathematics (STEM) disciplines; and build a more diverse pool of scientists and engineers to meet future workforce needs.

Work in this PE is performed by the Services' Research Offices and DoD Laboratories (includes the Army Research Laboratory and the Air Force Research Laboratory) for Centers of Excellence (COE). Centers currently funded through cooperative agreements include Autonomy, Cyber Security, Research Data Analysis, STEM Scholars, and Minority Women in STEM.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 1: Basic Research	R-1 Program Element (Number/Name) PE 0601228D8Z I Historically Black Colleges and Universities and Minority-Serving Institutions
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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	81.280	31.136	0.000	-	0.000
Current President's Budget	77.017	99.902	33.288	-	33.288
Total Adjustments	-4.263	68.766	33.288	-	33.288
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	68.864			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.967	-			
• Other Reprogramming	-0.016	-	-	-	-
• FFRDC	-	-0.098	-	-	-
• Adjustments to Budget Year	-	-	31.702	-	31.702
• Economic Assumption	-	-	1.586	-	1.586
• Administrative Correction	-1.280	-	-	-	-

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 448: *Historically Black Colleges and Universities and Minority-Serving Institutions*

Congressional Add: *HBCU/MI Program Increase*

Congressional Add: *Minority STEM Recruitment and Research*

Congressional Add Subtotals for Project: 448

Congressional Add Totals for all Projects

FY 2021	FY 2022
49.325	68.864
1.000	-
50.325	68.864
50.325	68.864

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

FY 2022 Appropriation reflects a Program Increase of \$68.864 million.

FY 2021 administrative correction reflected to account for reporting error documented in PE 0601228D8Z BA 02 line number 9.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 1					R-1 Program Element (Number/Name) PE 0601228D8Z / <i>Historically Black Colleges and Universities and Minority-Serving Institutions</i>				Project (Number/Name) 448 / <i>Historically Black Colleges and Universities and Minority-Serving Institutions</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
448: <i>Historically Black Colleges and Universities and Minority-Serving Institutions</i>	-	77.017	99.902	33.288	0.000	33.288	34.300	34.986	35.721	36.437	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Historically Black Colleges and Universities and Minority-Serving Institutions (HBCU/MI) program provides support in fields of science and engineering that are important to national defense. The Department of Defense (DoD) HBCU/MI Program encourages participation of small minority schools and large minority research institutions. This competitive program provides support through grants or contracts for research, education assistance, instrumentation purchases, and technical assistance as described below.

- Research. The research grants further knowledge in the basic scientific disciplines through theoretical and experimental activities. Collaborative research allows university professors to work directly with military laboratories or other universities.
- Education. Education assistance funds are used by minority institutions to strengthen their academic programs in science, technology, engineering, and mathematics (STEM), thereby increasing the number of under-represented minorities obtaining undergraduate and graduate degrees in these fields. These grants provide equipment, scholarships, cooperative work/study opportunities, visiting faculty programs, summer internship programs, and a variety of other enhancements designed to support students and to encourage them to pursue careers in STEM.
- Instrumentation purchases. The program allows universities to purchase basic laboratory equipment, such as lasers and spectrometers, for enhancements to the basic research efforts.
- Technical assistance. The funds are used to design programs that enhance the ability of minority institutions to successfully compete for future Defense funding by assisting the HBCU/MI community in areas such as proposal writing and administration of grants and contracts.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Historically Black Colleges and Universities and Minority-Serving Institutions (HBCU/MI)	26.692	31.038	33.288
Description: The HBCU/MI program provides support for research and collaboration with DoD facilities and personnel. The research grants further knowledge in the basic scientific and engineering disciplines through theoretical and empirical activities. Collaborative research allows university professors to work directly with DoD laboratories or other universities.			
FY 2022 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 1	R-1 Program Element (Number/Name) PE 0601228D8Z / <i>Historically Black Colleges and Universities and Minority-Serving Institutions</i>	Project (Number/Name) 448 / <i>Historically Black Colleges and Universities and Minority-Serving Institutions</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
Continue efforts from FY 2021. Conduct annual competition of the HBCU/MI program for basic research, student support, and/or equipment/instrumentation. Continue research and educational collaboration with the DoD laboratories. Continue the summer internship and faculty fellowship programs. Continue Centers of Excellence in support of the USD(R&E) priorities and the National Defense Strategy in the areas needed to expand STEM opportunities for underrepresented minorities. Conduct annual review of the Centers. Conduct outreach activities, to include one webinar and two technical assistance workshops to expose HBCUs/MIs to opportunities in the DoD.			
FY 2023 Plans: Conduct annual competition of the HBCU/MI program for basic research, student support, and/or equipment/instrumentation. Continue research and educational collaboration with the DoD laboratories. Continue the summer internship and faculty fellowship programs. Continue Centers of Excellence in support of the USD(R&E) priorities and the National Defense Strategy in the areas needed to expand STEM opportunities for underrepresented minorities. Conduct annual review of the Centers. Conduct outreach activities, to include one webinar and two technical assistance workshops to expose HBCUs/MIs to opportunities in the DoD. Maintain minority STEM recruitment efforts in partnership with the Science, Mathematics and Research for Transformation (SMART) Scholarship for Service Program as encouraged by Section 250 in the FY 2021 National Defense Authorization Act (NDAA). Continue support of HBCU/MI Pilot Initiative with the SMART Scholarship Program to develop and train the next generation of STEM leaders. Encourage HBCU/MI students to apply for SMART scholarships through targeted outreach including joint webinars focused on fostering a community of diversity and the STEM workforce. Continue to examine recommendations provided by the National Academies of Sciences, Engineering, and Medicine in the report to Congress on defense research at HBCUs and other MIs as required by Section 262 of the FY 2020 NDAA.			
FY 2022 to FY 2023 Increase/Decrease Statement: Changes reflect minor budget fluctuations.			
Accomplishments/Planned Programs Subtotals		26.692	31.038
		FY 2021	FY 2022
Congressional Add: HBCU/MI Program Increase		49.325	68.864
FY 2021 Accomplishments: Expand annual competition of the HBCU/MI program for equipment/instrumentation grants. Continue Centers of Excellence in support of the Under Secretary of Defense for Research and Engineering (USD(R&E)) priorities in the areas of Artificial Intelligence/Machine Learning (AI/ML), Quantum Science, and Fully-Networked Command, Control, and Communication. Continue STEM Centers of Excellence at the Center for STEM Scholars and the Center for Minority Women in STEM, needed to expand STEM opportunities for underrepresented minorities.			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 1	R-1 Program Element (Number/Name) PE 0601228D8Z / <i>Historically Black Colleges and Universities and Minority-Serving Institutions</i>	Project (Number/Name) 448 / <i>Historically Black Colleges and Universities and Minority-Serving Institutions</i>	
		FY 2021	FY 2022
Continue Aerospace Education Research and Innovation Center to support undergraduate research in materials and aerospace sciences relevant to DoD and to expand the future aerospace technical workforce, particularly for underrepresented populations. Conduct annual review of the Centers. Expand the HBCU/MI Program to develop new Centers of Excellence to address USD(R&E) priorities in the areas of Biotechnology and Materials Science. Conduct outreach activities, to include one webinar and one technical assistance workshop to expose HBCUs/MIs to opportunities in DoD.			
Maintain collaboration with the National Academies of Science, Engineering, and Medicine (NASEM) for the Minority-Serving Institutions Town Hall Series to examine strategies to expand STEM education and research activities at HBCU/MIs. Continue partnership with NASEM in support of the FY 2020 NDAA Section 262, National Study on Defense Research at HBCUs and other MIs. Monitor the University Affiliated Research Center HBCU Pilot Program supporting three regional HBCUs with research projects involving 5G, AI/ML, Cyber, and a ChatBot testbed to elevate the research profile and exposure to higher levels of defense research.			
FY 2022 Plans: Funding will augment quantum research and future aerospace training, as well as expand STEM opportunities for HBCU/MI scholars. In addition, funding will be used to advance the research and development capabilities of HBCU/MIs by increasing the number of grants awarded.			
Congressional Add: Minority STEM Recruitment and Research		1.000	-
FY 2021 Accomplishments: Conduct minority STEM recruitment in partnership with the Science, Mathematics, and Research for Transformation (SMART) Scholarship for Service Program as encouraged by Section 250 in the FY 2021 NDAA. Support HBCU/MI Pilot Program with the SMART Scholarship Program to develop and train the next generation of STEM leaders. Encourage HBCU/MI students to apply for SMART scholarships through targeted outreach including joint webinars focused on fostering a community of diversity and the STEM workforce. Collaborate with the Air Force Research Laboratory's Minority Leaders Program to enhance STEM training for underrepresented populations in support of national security needs and the defense mission. Host a brainstorming meeting with stakeholders in the community to identify any new programming needed to round out the portfolio.			
Congressional Adds Subtotals		50.325	68.864
C. Other Program Funding Summary (\$ in Millions)			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 1	R-1 Program Element (Number/Name) PE 0601228D8Z / <i>Historically Black Colleges and Universities and Minority-Serving Institutions</i>	Project (Number/Name) 448 / <i>Historically Black Colleges and Universities and Minority-Serving Institutions</i>

C. Other Program Funding Summary (\$ in Millions)

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 2: Applied Research</i>	PE 0601228D8Z I <i>Historically Black Colleges and Universities/Minority Institutions</i>											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	1.280	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	-	-
449: <i>Historically Black Colleges and Universities/Minority Institutions</i>	-	1.280	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	-	-

Note

Administrative reporting error - The FY 2021 \$1.280 million should be reflected in project 448, BA 01, line number 7 and will be corrected in the next cycle.

A. Mission Description and Budget Item Justification

Refer to PE 0601228D8Z BA 01 line number 7. Administrative reporting error - The FY 2021 \$1.280 million should be reflected in project 448, BA 01, line number 7 and will be corrected in the next cycle.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	1.280	0.000	0.000	-	0.000
Total Adjustments	1.280	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Administrative Correction	1.280	-	-	-	-

Change Summary Explanation

The FY 2021 \$1.280 million should be reflected in project 448, BA 01, line number 7 and will be corrected in the next cycle.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022																		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0601228D8Z / <i>Historically Black Colleges and Universities/Minority Institutions</i>				Project (Number/Name) 449 / <i>Historically Black Colleges and Universities/Minority Institutions</i>																			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost																
449: <i>Historically Black Colleges and Universities/Minority Institutions</i>	-	1.280	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	-	-																
<p>Note Administrative reporting error - The FY 2021 \$1.280 million should be reflected in project 448, BA 01, line number 7 and will be corrected in the next cycle.</p> <p>A. Mission Description and Budget Item Justification Refer to PE 0601228D8Z BA 01 line number 7. Administrative reporting error - The FY 2021 \$1.280 million should be reflected in project 448, BA 01, line number 7 and will be corrected in the next cycle.</p> <p>B. Accomplishments/Planned Programs (\$ in Millions)</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>FY 2021</th> <th>FY 2022</th> <th>FY 2023</th> </tr> </thead> <tbody> <tr> <td>Title: Historically Black Colleges and Universities and Minority-Serving Institutions (HBCU/MI)</td> <td align="right">1.280</td> <td align="center">-</td> <td align="center">-</td> </tr> <tr> <td>Description: Please refer to PE 0601228D8Z BA 01 line number 7 for details.</td> <td></td> <td></td> <td></td> </tr> <tr> <td align="right">Accomplishments/Planned Programs Subtotals</td> <td align="right">1.280</td> <td align="center">-</td> <td align="center">-</td> </tr> </tbody> </table> <p>C. Other Program Funding Summary (\$ in Millions) N/A</p> <p>Remarks</p> <p>D. Acquisition Strategy N/A</p>														FY 2021	FY 2022	FY 2023	Title: Historically Black Colleges and Universities and Minority-Serving Institutions (HBCU/MI)	1.280	-	-	Description: Please refer to PE 0601228D8Z BA 01 line number 7 for details.				Accomplishments/Planned Programs Subtotals	1.280	-	-
	FY 2021	FY 2022	FY 2023																									
Title: Historically Black Colleges and Universities and Minority-Serving Institutions (HBCU/MI)	1.280	-	-																									
Description: Please refer to PE 0601228D8Z BA 01 line number 7 for details.																												
Accomplishments/Planned Programs Subtotals	1.280	-	-																									

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 2: Applied Research					R-1 Program Element (Number/Name) PE 0602000D8Z I Joint Munitions Technology							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	24.098	20.529	18.961	0.000	18.961	19.493	19.883	20.302	20.708	Continuing	Continuing
076: Enhanced Munitions	-	17.676	20.529	18.961	0.000	18.961	19.493	19.883	20.302	20.708	Continuing	Continuing
204: Enabling Fuze Technology	-	6.422	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

New Start (Y/N): No

This Program Element (PE 0602000D8Z) aligns with and compliments PE 0603000D8Z, Joint Munitions Advanced Technology. Prior to FY 2022, two project codes within each PE formed the 6.2 applied research and 6.3 technology demonstration components of the Joint Enhanced Munitions Technology Program (JEMTP) and the Joint Fuze Technology Program (JFTP). The JEMTP funds applied research efforts from PE 0602000D8Z Project code (P) 076 Enhanced Munitions and technology demonstration efforts from PE 0603000D8Z P077. The JFTP funds applied research efforts from PE 0602000D8Z P204 Enabling Fuze Technology and technology demonstration efforts from PE 0603000D8Z P301. In FY 2022, the JFTP and JEMTP merged and the program scope expanded to exploit technology developments and accelerate their application to enable next generation kinetic weapons capabilities in the areas of energetic materials, propulsion, warhead effects, fuzing, power sources, guidance, navigation and control, communications and munitions airframe applied technologies.

With the JFTP and JEMTP merge in FY 2022, the P204 Enabling Fuze Technology line and budget have combined in P076 Enhanced Munitions.

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression, Defend the Homeland, and Build Sustainable and Long-Term Advantage.

This program conducts cross-cutting, foundational research improving the lethality, range, reliability, safety, survivability, and effectiveness of kinetic weapon systems to rapidly advance U.S. capabilities necessary for the Joint Fight. The program technology objectives include: high-speed weapon delivery, longer range precision effects, networked and collaborative systems of systems, agility at the engagement level, increased capacity / affordable munitions, survivability during delivery and target engagement, and open systems architecture. The program develops enabling technologies specific to kinetic weapon munitions (warheads, propulsion, advanced lethality mechanisms, state of the art fuzing technologies, and pioneering targeting technologies) from a Joint Service, multi-domain perspective, thus maximizing efficiencies and ensuring the development of technologies with the broadest applicability to ensure good stewardship of taxpayer dollars.

In order to maintain superior power protection capabilities against near peer adversaries, there is an urgent need to provide U.S. warfighters with augmented or new capabilities to ensure technical superiority. The program follows a threat/opportunity analysis to develop kinetic capabilities that enable scenario-based effects from a Joint Fight perspective by exploring technological advances that are beyond Service investment risk acceptance and target asymmetric advantage. The goal is to enable military dominance to ensure effective deterrence of adversary aggression.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 0602000D8Z <i>I Joint Munitions Technology</i>
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The program will invest in technologies that will enable U.S. warfighters to maintain or regain operational and battlefield advantages that technologies can provide through increased performance, range, and lethality to improve the Joint Force military advantages and build a more lethal force across all contested domains – air, land, sea, and space. This program's investment portfolio has been aligned to complement and utilize the Department's priority technology areas.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	24.397	19.591	0.000	-	0.000
Current President's Budget	24.098	20.529	18.961	-	18.961
Total Adjustments	-0.299	0.938	18.961	-	18.961
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	1.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.294	-			
• Other Reprogramming	-0.005	-	-	-	-
• FFRDC	-	-0.062	-	-	-
• Adjustments to Budget Year	-	-	18.742	-	18.742
• Economic Assumption	-	-	0.219	-	0.219

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 076: *Enhanced Munitions*

Congressional Add: *Advanced Energetics for Long Range Munitions*

Congressional Add: *Next Generation Explosives and Propellants*

Congressional Add Subtotals for Project: 076

Congressional Add Totals for all Projects

	FY 2021	FY 2022
	5.000	-
	-	1.000
Congressional Add Subtotals for Project: 076	5.000	1.000
Congressional Add Totals for all Projects	5.000	1.000

Change Summary Explanation

FY 2022 funding increase reflects \$1.000 million Congressional add for Next Generation Explosives and Propellants.

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602000D8Z / Joint Munitions Technology				Project (Number/Name) 076 / Enhanced Munitions			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
076: Enhanced Munitions	-	17.676	20.529	18.961	0.000	18.961	19.493	19.883	20.302	20.708	Continuing	Continuing

A. Mission Description and Budget Item Justification

The enhanced munitions effort investigates and develops advanced energetics concepts and explosive and propellant materials with the potential to improve the performance, range, speed, and lethality of weapons. Technologies and concepts developed will have the potential to impact multiple munitions types with wide applicability to improve the performance, lethality, speed, and range of weapons to ensure the U.S. is not outgunned and outranged on the battlefield of the future.

Through FY 2021, the Joint Enhanced Munitions Technology Program (JEMTP) investments focused on five Munition Areas: 1) High Performance Rocket Propulsion, 2) Minimum Signature Rocket Propulsion, 3) Area Effects Warheads, 4) Hard Target Effects Warheads, and 5) Gun Propulsion. Munition Area Technology Groups (MATG), under tri-service leadership, have developed technology roadmaps for each Munition Area which is used to guide investments based on goals consistent with the National Defense Strategy. The improved performance technologies developed, alone or in combination, will be incorporated in hardware, simulating real-world munitions, to demonstrate their utility and feasibility as part of Technology Transition Agreements with Program Executive Offices (PEOs).

In FY 2022, the Joint Fuze Technology Program (JFTP) and JEMTP merged and the program scope expanded to exploit technology developments, such as hypersonics, machine learning, artificial intelligence, quantum computing, and to accelerate their application to enable next generation kinetic weapons capabilities in the areas of energetic materials, advanced propulsion, warhead effects, enabling fuze technologies, and pioneering targeting technologies with a specific focus on enhancing kinetic weapons lethality, range and resultant effects. The program will retain tri-Service leadership to inform technology investments accelerating development across the Department. Investments will be informed by a threat-opportunity based analysis that focuses on developing weapons systems that exploit technology dominance to ensure military objectives in Joint Force campaign scenarios. New technology roadmaps for munition technical areas will guide investments consistent with the National Defense Strategy and inform Service technology investments.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Enhanced Munitions	12.676	19.529	18.961
Description: Enhanced Munitions enabling technologies focus on the following key areas: <ul style="list-style-type: none"> - Munitions Versatility: Combined and Collaborative Kinetic Effects - Munitions Readiness: Modularity, Advanced Manufacturing and Materials - Munitions Efficiency: Weapon Survivability - Munitions Effectiveness: <ul style="list-style-type: none"> • Munitions Kinetic and Tailorable Lethality Effects • Propulsion Systems • Target Detection and Burst Point Control 			
FY 2022 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602000D8Z / <i>Joint Munitions Technology</i>	Project (Number/Name) 076 / <i>Enhanced Munitions</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>In FY 2022, the JFTP merged with the JEMTP, and the program scope expanded to holistically address S&T that will enable next generation kinetic weapons capabilities, specifically, energetic materials, advanced propulsion, warhead lethal effects, enabling fuze technologies, and advanced targeting. Existing projects will be realigned to the new program structure and re-competed against potential new efforts program-wide.</p> <ul style="list-style-type: none"> - Fabricate test motors with novel propellant material and validate improved performance. Conduct full scale testing on novel propulsion system to prepare for demonstration transition. - Prepare full-scale demonstration and complete testing on novel explosive initiation technique. - Develop low erosion missile nozzle using unique procedure and begin mechanical testing. - Complete structural modeling, fabrication, loading, and testing of first series improved lethality warhead. - Develop critical fuze component and munitions technologies for embedded, smart fuzes to enable networked weapons effects and precision warhead detonation. - Develop additively manufactured fuzing radome technology to enhance target detection performance and resistance to jamming in contested environments. - Develop new multi-mode ultrafast targeting algorithms exploiting advancements in microelectronics and materials. - Develop technologies to enable collaborate weapons communication and networking facilitating improved guidance, target detection, and weapons effectiveness. <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Complete novel propellant testing and validate data to modelling and simulation results. - Finalize prototype novel missile low erosion nozzle design and conduct testing in realistic temperature regimes. - Complete characterization of novel new explosive material and formulate with novel metal fuels, to start down-selection process of formulations to enable fabrication of mid-scale samples for testing. - Complete End-to-End machine learning radar with significant improvement in Electronic Countermeasure Resistance by completing laboratory prototyping with a software defined radio and RF simulator. - Initiate machine learning based target detection design based on algorithm and database option exploration for high speed weapon fuzing. - Demonstrate target detection research with evaluation of implemented solution to determine effectiveness of enhanced technology for survivability and precise trigger timing to enhance lethality. <p>FY 2022 to FY 2023 Increase/Decrease Statement: Changes reflect minor deviations in budget priorities.</p>			
Accomplishments/Planned Programs Subtotals		12.676	19.529
		18.961	

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602000D8Z / <i>Joint Munitions Technology</i>	Project (Number/Name) 076 / <i>Enhanced Munitions</i>

	FY 2021	FY 2022
Congressional Add: Advanced Energetics for Long Range Munitions FY 2021 Accomplishments: - Explore advanced energetics concepts and accelerate development of new explosive and propellant materials to drive improvements to the performance, range, and lethality of weapons. - Application of machine learning tools and techniques for advanced energetics discovery and applied research of energetics suitable for long range/high speed munitions propellant applications.	5.000	-
Congressional Add: Next Generation Explosives and Propellants FY 2022 Plans: Explosives and propellants are crucial to address U.S. Forces capability needs for enhancing weapon lethality, range and speed against advanced adversary threats. Program increase will be used to accelerate Joint Enhanced Munitions Technology Program efforts for advanced explosives and propellants to enhance Joint Force munitions effectiveness and readiness and support future warfighting needs across all domains.	-	1.000
Congressional Adds Subtotals	5.000	1.000

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602000D8Z / Joint Munitions Technology				Project (Number/Name) 204 / Enabling Fuze Technology			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
204: Enabling Fuze Technology	-	6.422	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

Project 204 funding was realigned to Project 076, Enhanced Munitions, in FY 2022.

A. Mission Description and Budget Item Justification

This effort strategically develops fuze-enabling technologies needed to develop weapons that address Joint fight capability areas including ones highlighted by the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) Munitions Science and Technology (S&T) Joint strategy and Technology-Focused Modernization such as High Speed Weapons, Networked Munitions, Air Defense, and Scalable Lethality. This effort identifies and matures fuze enabling technologies at the laboratory scale and transitions them into Budget Activity (BA) 6.3 technology maturation and demonstration programs.

The Joint Fuze Technology Program (JFTP) investments are focused on four fuze capability areas that reflect U.S. fuzing capability gaps: 1) Extreme Environment Survivable Fuzing, 2) Tailorable Effects Fuzing and Warhead Initiation, 3) High Reliability Safe and Arm Technology, and 4) Target Detection and Burst Point Control.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Enabling Fuze Technology	6.422	-	-
Description: Enabling Fuze Technology focuses on the following areas: - Extreme Environmental Survivable Fuzing: Challenges are addressed with improved modeling and simulation (M&S) capabilities to provide the computational tools necessary to understand extreme weapon environments, test equipment, instrumentation, and analysis techniques that provide basic phenomenology and understanding of the fuze environment, and survivable fuze components developed to increase the effectiveness of hypersonic munitions by improving the prediction tools and testing methodologies to evaluate the survivability and functionality of future fuzes. Development of these technologies will enable next generation hypersonic weapon fuzes to survive and function. - Tailorable Effects Fuzing and Warhead Initiation: Develops technologies for tailorable effects weapons that encompass the ability to selectively vary the output of the weapon and the ability to generate selectable effects, initiation and multi-point technologies, electronic safe and arm based multi-point initiators, and embedded fuzing for high speed/penetrating weapons. - High Reliability Safe and Arm Technology: Develops highly reliable common fuzing architectures, miniature/high efficiency munitions power sources, and Unexploded Ordnance (UXO) reduction features. - Target Detection and Burst Point Control: Develops sensing and algorithm foundational technologies for precision target detection while meeting or exceeding the performance of existing technologies in order to operate in contested and high speed weapon environments.			
Accomplishments/Planned Programs Subtotals	6.422	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602000D8Z / Joint Munitions Technology	Project (Number/Name) 204 / Enabling Fuze Technology
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy N/A		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 0602128D8Z I <i>Promotion and Protection Strategies</i>											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	3.275	-	3.275	3.275	3.275	3.275	3.275	Continuing	Continuing
231: <i>Promotion and Protection Strategies</i>	-	0.000	0.000	3.275	-	3.275	3.275	3.275	3.275	3.275	Continuing	Continuing

Note

New Start (Y/N): Yes

A. Mission Description and Budget Item Justification

This Program Element (PE) is established to execute activities to balance the promotion and protection of technologies.

For the Biotechnology MEMBER initiative, work executed under this PE line will bring together the Acquisition (e.g., PEOs, PMs, technology warrant officers, etc.), Policy, and Research and Engineering communities to establish a Biotechnology War Room (BWR). The War Room will ensure integration of innovative biomanufactured products into DoD's systems and platforms through holistic acquisition and investment strategies.

The Biotechnology War Room (BWR) will create the first coordinating body at DoD to centralize acquisition efforts for biotechnology. By providing visibility, fostering partnerships across DoD, and incentivizing industry transition partners, the BWR will support a developmental ecosystem in which new technologies are not only pushed to higher BACs from lower ones, but where personnel and industry partners at higher BACs pull on technologies being developed at lower ones. This will serve as the nucleus of a defense industrial base for biotechnology that delivers innovative biomanufactured products into DoD's systems and platforms.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	3.275	-	3.275
Total Adjustments	0.000	0.000	3.275	-	3.275
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Year	-	-	3.275	-	3.275

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 0602128D8Z I <i>Promotion and Protection Strategies</i>	
<div style="margin-bottom: 10px;"><u>Change Summary Explanation</u></div> <div>FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.</div>		

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602128D8Z / <i>Promotion and Protection Strategies</i>				Project (Number/Name) 231 / <i>Promotion and Protection Strategies</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
231: <i>Promotion and Protection Strategies</i>	-	0.000	0.000	3.275	-	3.275	3.275	3.275	3.275	3.275	Continuing	Continuing

Note
New Start (Y/N): Yes

A. Mission Description and Budget Item Justification
This Program Element (PE) is established to execute activities to balance the promotion and protection of technologies.

For the Biotechnology MEMBER initiative, work executed under this PE line will bring together the Acquisition (e.g., PEOs, PMs, technology warrant officers, etc.), Policy, and Research and Engineering communities to establish a Biotechnology War Room (BWR). The War Room will ensure integration of innovative biomanufactured products into DoD's systems and platforms through holistic acquisition and investment strategies.

The Biotechnology War Room (BWR) will create the first coordinating body at DoD to centralize acquisition efforts for biotechnology. By providing visibility, fostering partnerships across DoD, and incentivizing industry transition partners, the BWR will support a developmental ecosystem in which new technologies are not only pushed to higher BACs from lower ones, but where personnel and industry partners at higher BACs pull on technologies being developed at lower ones. This will serve as the nucleus of a defense industrial base for biotechnology that delivers innovative biomanufactured products into DoD's systems and platforms.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Title: Promotion and Protection Strategies Description: Ensure integration of biomanufactured products into DoD's systems and platforms through acquisition and investment. FY 2023 Plans: The Biotechnology War Room (BWR) will concentrate on the following activities: <ul style="list-style-type: none"> Establish strategies to build new pilot/industrial scale manufacturing facilities with an innovation center incorporated to facilitate partnership with DoD and exploit collaboration opportunities with our allies. Integrate stakeholders and align the Service and USG requirements with the development and manufacturing of bioproducts; identify capability gaps and opportunities for bioproducts to meet military requirements. Evaluate current acquisition pathways, including integration of new technology through primes/integrators and/or DoD acquisition programs; and propose policy guidelines to better enable acquisition and sustainment. 	-	-	3.275

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602128D8Z / <i>Promotion and Protection Strategies</i>	Project (Number/Name) 231 / <i>Promotion and Protection Strategies</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> • Develop and execute pilot programs (e.g. demo days, etc...) to test out identified acquisition pathways and incentivize industry (e.g., traditional Primes of weapons systems and equipment, such as Lockheed Martin, Boeing, etc.) to integrate bioproducts into their supply chain. <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> New Program Element starting in FY 2023.</p>			
Accomplishments/Planned Programs Subtotals		-	-
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 0602230D8Z I <i>Defense Technology Innovation (Beyond 5G)</i>											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	0.000	17.109	17.428	20.634	0.000	20.634	10.339	12.406	12.667	12.920	Continuing	Continuing
230: <i>Defense Technology Innovation (Beyond 5G)</i>	0.000	17.109	17.428	20.634	0.000	20.634	10.339	12.406	12.667	12.920	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program will build upon the technology foundation that underlies fifth-generation cellular network (5G) systems as a basis to create the next generation of wireless cellular network and security technologies for military applications. Working in concert with other U.S. Government science and technology agencies, this DoD program will enable the U.S. to regain leadership in emerging wireless technology standards including sixth generation (6G) and beyond by investing in research and workforce development in critical technologies. The development of an engagement plan with other Departments, agencies, industry, and universities will ensure continued U.S. influence in both the international commercial marketplace as well as Government sectors.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	17.109	22.918	0.000	0.000	0.000
Current President's Budget	17.109	17.428	20.634	0.000	20.634
Total Adjustments	0.000	-5.490	20.634	0.000	20.634
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-5.418			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• FFRDC	-	-0.072	-	-	-
• Adjustments to Budget Year	-	-	19.922	-	19.922
• Economic Assumption	-	-	0.712	-	0.712

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602230D8Z / Defense Technology Inn ovation (Beyond 5G)				Project (Number/Name) 230 / Defense Technology Innovation (Beyond 5G)			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
230: Defense Technology Innovation (Beyond 5G)	0.000	17.109	17.428	20.634	0.000	20.634	10.339	12.406	12.667	12.920	Continuing	Continuing

Note

Funding in FY 2022 will be under new Project Code 230, to change the Project Code title to "Beyond 5G." The requirement and efforts remain unchanged.

A. Mission Description and Budget Item Justification

This program will build upon the technology foundation that underlies fifth-generation cellular network (5G) systems as a basis to create the next generation of wireless cellular network and security technologies for military applications. Working in concert with other U.S. Government science and technology agencies, this DoD program will enable the U.S. to regain leadership in emerging wireless technology standards including sixth generation (6G) and beyond by investing in research and workforce development in critical technologies. The development of an engagement plan with other Departments, agencies, industry, and universities will ensure continued U.S. influence in both the international commercial marketplace as well as Government sectors.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Title: Beyond 5G	17.109	17.428	20.634
Description: Build upon the technology foundation that underlies fifth-generation cellular network (5G) systems as a basis to create the next generation of wireless cellular network and security technologies for military applications. Working in concert with other U.S. Government science and technology agencies, this DoD program will enable the U.S. to regain leadership in upcoming wireless technology standards including sixth generation (6G) and beyond by investing in research and workforce development in critical technologies. The development of an engagement plan with other Departments, agencies, industry, and universities will ensure continued U.S. influence in both the international commercial marketplace as well as Government sectors.			
FY 2022 Plans: DoD will continue this investment through the collaborative mechanisms with NSF and NIST noted above – in early-stage technology testbeds, novel hardware and software components, and fellowship/training programs. DoD will broadly continue initiatives in the FY 2021 areas: <ul style="list-style-type: none">• Radio Frequency (RF) and massive MIMO technology.• Spectrum reuse/network resource utilization based on novel machine learning concepts.• Highly dynamic spectrum sharing using multiple degrees of freedom in contested/congested scenarios.• Robust, reconfigurable, and secure software-defined networking.• Edge computing for ultra-reliable, low latency applications.			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602230D8Z / <i>Defense Technology Innovation (Beyond 5G)</i>	Project (Number/Name) 230 / <i>Defense Technology Innovation (Beyond 5G)</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>DoD will adapt its R&D investment strategy/award mix based on the companion Prototyping and Experimentation testbed deployments.</p> <p><i>FY 2023 Plans:</i> DoD will continue to invest in technology testbeds, novel hardware and software components, and fellowship/training programs with new and existing partners.</p> <p>DoD will broadly continue initiatives from FY 2022, specifically Radio Frequency (RF) and massive MIMO technology, spectrum reuse/network resource utilization based on novel machine learning concepts, and highly dynamic spectrum sharing using multiple degrees of freedom in contested/congested scenarios. Other continued work in robust, reconfigurable, and secure software-defined networking, as well as edge computing for ultra-reliable, low latency applications will continue to be supported.</p> <p>DoD will continue to adapt its R&D investment strategy/award mix based on the companion Prototyping and Experimentation testbed deployments.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> Increase is due to budget fluctuation.</p>			
Accomplishments/Planned Programs Subtotals		17.109	17.428
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 0602234D8Z / <i>Lincoln Laboratory</i>											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	38.338	55.516	46.159	-	46.159	47.682	48.776	49.831	50.827	Continuing	Continuing
534: <i>Lincoln Laboratory</i>	-	38.338	52.016	42.534	-	42.534	44.049	45.143	46.122	47.045	Continuing	Continuing
815: <i>Cyber Security, Science and Engineering</i>	-	0.000	3.500	3.625	-	3.625	3.633	3.633	3.709	3.782	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiative to Build Sustainable and Long-Term Advantage.

The MIT Lincoln Laboratory (MIT LL) research project, 534, is an advanced technology research and development effort conducted through a cost reimbursable contract with the Massachusetts Institute of Technology (MIT). The MIT LL project supports innovative, multi-disciplined research that addresses critical national security problems. The project funds innovations that directly lead to the development of new system concepts, technologies, components, and materials in support of Department of Defense (DoD) missions. Funding supports high-risk, high-payoff research, which provides unique and specialized capabilities for the current and emerging needs of the DoD. The project funds nine technology areas. Of the technology areas, there are four core-technology areas: Advanced Devices; Optical Systems and Technology; Information, Computation and Exploitation Sciences; and Radio-Frequency (RF) Systems and Technologies. There are four emerging-technology initiatives: Advanced Materials and Processes; Quantum System Sciences; Biomedical Sciences and Technology; and Autonomous Systems. There is one Integrated Systems technology area, which focuses on combining novel component-level technologies to create system-level technology solutions for important DoD problems.

These nine technology areas provide critical capabilities that support all DoD mission areas pursued at the Laboratory. The categories are selected in consultation with the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) aligned with the DoD Communities of Interest (ColIs), and with guidance from other DoD agencies to address technology as well as system needs. The research in these categories adapts to solve emerging DoD problems as well as long-standing problems to which new technology advances can be applied. The individual efforts in each area are selected with the goal of enhancing DoD capabilities significantly, rather than incrementally.

Note: In FY 2019, the tenth technology area, Cyber Security, Science and Engineering, moved to individual project code 815.

Supporting these and other priority technology and capability areas are work efforts titled Cyber Security, Science and Engineering under project code 815, which began in FY 2019. The Cyber Security, Science and Engineering research project, 815, supports innovative research that addresses critical national security problems in cyber. The project funds innovations that directly lead to the development of new system concepts, technologies, and algorithms in support of DoD missions. Funding supports high-risk, high-payoff research, which provides unique and specialized capabilities for the current and emerging needs of the DoD.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 0602234D8Z I <i>Lincoln Laboratory</i>
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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	41.053	55.692	0.000	-	0.000
Current President's Budget	38.338	55.516	46.159	-	46.159
Total Adjustments	-2.715	-0.176	46.159	-	46.159
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.239	-			
• SBIR/STTR Transfer	-1.468	-			
• Other Reprogramming	-0.008	-	-	-	-
• FFRDC	-	-0.176	-	-	-
• Adjustments to Budget Year	-	-	44.567	-	44.567
• Economic Assumption	-	-	1.592	-	1.592

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602234D8Z / Lincoln Laboratory				Project (Number/Name) 534 / Lincoln Laboratory			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
534: Lincoln Laboratory	-	38.338	52.016	42.534	-	42.534	44.049	45.143	46.122	47.045	Continuing	Continuing

A. Mission Description and Budget Item Justification

The nine Lincoln Laboratory (LL) research areas that comprise the overall research and development portfolio are described below.

Four core-technology areas:

- Advanced Devices emphasizes the development of devices and subsystems utilizing microelectronic, photonic, biological, and chemical technologies to enable new approaches to DoD systems. Efforts include technologies for high power Radio Frequency (RF) devices; multi-function, highly integrated lasers; fast and sensitive imagers; and mechanical microsystems for autonomous systems.
- Optical Systems and Technology focuses on developing optical technologies for visible, infrared, and wide band spectroscopic sensing as well as communications systems. The efforts include high energy lasers; scalable focal plane imaging technology; photonic integrated circuits; optical system prototypes; and associated phenomenology measurements.
- Information, Computation and Exploitation Sciences develops novel architectures, tools, and techniques for the processing, fusion, interpretation, computation, and exploitation of multi-sensor, multi-intelligence data. Efforts include innovative hardware and software technologies for graph processors and cloud computing; artificial intelligence (AI) and graph algorithms for analytics, including deep learning algorithms; multi-intelligence analytics, including open-source data processing techniques; and human-machine interfacing and automation technologies to enhance warfighter effectiveness and ability to work with advanced computing systems.
- Radio Frequency (RF) Systems and Technology focuses on RF technologies to enhance warfighting capabilities in radars, electronic warfare (EW), and communications. Efforts include development of next generation phased arrays; ultra-wideband RF systems; compact RF systems; small satellite RF payload; and advanced algorithms for jammer mitigation and EW.

Four emerging-technology areas:

- Advanced Materials and Processes emphasizes research in new materials for additive manufacturing and emerging nanoscale materials. Efforts include research in understanding and controlling diamond chemical vapor deposition to support emerging and future applications; novel growth and transfer strategies for low-defect III-V devices; microwave circuits built with 3D printing; programmable shape change materials; and microsystems using metamaterials.
- Quantum System Sciences focuses on the development of quantum-based technologies that support sensing, communication, computation, and algorithms using quantum information. Efforts include the demonstration of scalable computation platforms, magnetic field sensing using highly-compact, atomic-like defects in diamond, prototyping revolutionary quantum networking systems and technology, and research into advanced quantum algorithms and their applications.
- Biomedical Sciences and Technology supports the development of bio-engineered and biomedical technologies to aid the warfighter. Efforts include brain imaging technologies; relevant research in brain and cognitive sciences including brain-computer interfacing (BCI); engineered biological systems to aid physiology understanding; and technologies to assess physical performance and enhance injury recovery. The Lincoln Laboratory discontinued line funding for the Biomedical Sciences and Technology (BST) area starting in FY 2021.
- Autonomous Systems has the objective of developing mobile, autonomous, robotic platforms, as well as sensors and algorithms that support key capabilities needed for a wide range of DoD applications. Efforts span advanced AI and processing; sensors and communications for unmanned platforms; platform designs and energy systems; human-machine interactions; and verification and validation of autonomous systems.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 2		R-1 Program Element (Number/Name) PE 0602234D8Z / Lincoln Laboratory	Project (Number/Name) 534 / Lincoln Laboratory		
The Lincoln Laboratory will discontinue Line funding for the Biomedical Sciences and Technology (BST) area starting in FY 2021.					
One system technology area: • Integrated Systems technology efforts use multiple new technologies to solve important national problems. Efforts selected for funding have an applied research component focused on integrated technology capability or technologies that facilitate greater levels of integrated capability. Projects target key DoD warfare domains, including space, air, land, sea surface, and undersea.					
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Title: Advanced Devices Description: This project area targets the research and development of unique and innovative components, subsystems, and sensing concepts or methodologies that will enable new solutions to important DoD problems. Activities under this technology area include revolutionary imaging technologies, specialized silicon and compound semiconductor-based devices for radio frequency (RF), analog, mixed-signal, and digital electronics; photonics, optoelectronics and laser technologies; microsystems; components and subsystems enabling advanced computing; and novel devices and concepts for chemical, biological, and radiation sensing. FY 2022 Plans: The Advanced Devices program will continue many of its ongoing efforts with the goal of advancing this applied research to a stage where it can be transitioned to other programs. In particular, it is expected that nearer-term transition opportunities will be developed for the imager, sync processor, and millimeterwave photonic signal processor work in order to expand the development efforts for these technologies. FY 2023 Plans: The Advanced Devices program will continue many of its ongoing efforts with the goal of advancing this applied research to a stage where it can be transitioned to other programs. In particular, it is expected that nearer-term transition opportunities will be developed for Multi-GHz Lasers for Quantum Networks, Midwave Infrared Integrated Photonics, and Enabling Technologies for Free-Space Optical Communications. FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.			4.589	5.100	4.520
Title: Optical Systems and Technologies Description: The project area conducts research through the development, analysis, and demonstration of novel concepts, technology, and systems for the next-generation of optical systems for the DoD. This area invests in optical systems technologies that fill the critical technology gaps in emerging DoD threat areas, such as anti-access/area denial (A2/AD), counter-weapons of mass destruction (C-WMD), and asymmetric warfare, as well as to develop revolutionary technologies in the traditional DoD			4.893	5.500	4.397

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 2		R-1 Program Element (Number/Name) PE 0602234D8Z / Lincoln Laboratory	Project (Number/Name) 534 / Lincoln Laboratory		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
mission areas, such as intelligence, surveillance, and reconnaissance (ISR), space control, communications, and ballistic missile defense. FY 2022 Plans: The Optical Systems Technology program will continue to solicit advanced technologies in lasers and receivers as well as in novel optical systems and architectures for next-generation capabilities for national security challenges. FY 2023 Plans: The Optical Systems Technology program will continue to solicit advanced technologies in lasers, receivers, imaging systems as well as in novel optical systems and architectures for next-generation capabilities for national security challenges. FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.					
Title: Radio Frequency (RF) Systems and Technologies Description: This project area focuses on research, development, and evaluation of innovative RF technologies and concepts in anticipation of DoD and intelligence community requirements for radar, signals intelligence (SIGINT), communications, and electronic-warfare (EW) applications. Key RF challenges include a rapidly expanding threat spectrum, platforms with severely constrained payloads, operations in strong clutter and interference environments, detection of difficult targets, and robustness against sophisticated electronic attack. RF technologies of interest include antennas, filters, transmit/receive modules (high-power amplifier, low-noise amplifier, phase shifter, time domain up-sampling), beamformers (analog, digital, photonic), receivers/exciters (local oscillator, mixers, filters, analog-to-digital converter, digital-to-analog converter), and novel RF packaging concepts. RF systems concepts that address novel analog/digital/photonic architectures and signal processing techniques for improved RF performance are also of interest. FY 2022 Plans: The RF Systems program will continue to focus research on advanced RF technologies in support of emerging needs for radar, SIGINT, communications, and EW systems. FY 2023 Plans: The RF Systems program will continue to focus research on advanced RF technologies in support of emerging needs for next generation phased arrays, compact RF systems, and wideband RF systems. FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.			3.798	4.200	4.453
Title: Information, Computation, and Exploitation Sciences			5.137	5.806	6.198

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 2		R-1 Program Element (Number/Name) PE 0602234D8Z / Lincoln Laboratory	Project (Number/Name) 534 / Lincoln Laboratory		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>Description: This project area achieves significant technical gains in data processing, computation, and exploitation. The volume, velocity, and variety of information production and consumption in the DoD/Intelligence Community (IC) are growing at exponential rates, requiring the development of innovative ways to deal with this data deluge. Emerging artificial intelligence (AI)/ machine learning (ML)-based technologies have the potential to significantly improve military capabilities in traditional domains such as Intelligence, Surveillance, and Reconnaissance (ISR), Command and Control (C2), and Electronic Warfare (EW) in addition to new areas such as grey zone operations. The project area is structured around a canonical AI-based decision support architecture that addresses the end-to-end processing chain, which includes data conditioning, algorithms, and human-machine teaming to determine courses of action, as well as the advanced heterogeneous computing required to convert raw data into insight. Furthermore, the program addresses specific DoD/IC challenges, such as limited training data and decision process explainability.</p> <p>FY 2022 Plans: The Information, Computation, and Exploitation Sciences program will continue applied research and development along several key technical thrusts, including predictive and prescriptive analytics, automated Processing, Exploitation and Dissemination (PED), advanced computing technologies, and human-machine teaming, all within the context of the AI oriented decision support architecture.</p> <p>FY 2023 Plans: The Information, Computation, and Exploitation Sciences program will continue applied research and development along several key technical thrusts, including predictive and prescriptive analytics, automated Processing, Exploitation and Dissemination (PED), advanced computing technologies, and human-machine teaming, all within the context of the AI oriented decision support architecture.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.</p>					
<p>Title: Autonomous Systems</p> <p>Description: This project area performs applied research in autonomous robotics to address current and anticipated national security needs. One project area goal is to enable unmanned systems to perform useful tasks in uncertain environments as trusted, capable agents without continuous human operator control. Project elements include the development of autonomy algorithms and technologies, and of infrastructure to quickly develop autonomous systems. Lincoln Laboratory also collaborates with research universities to transfer promising autonomy concepts from academia into prototype systems. Technology areas include perception and world modeling, planning, human-robot interaction, manipulation, learning and adaptation, and robotic platforms. Efforts range in scope from simulation-based seedlings to prototype efforts demonstrating autonomous system capabilities in relevant environments.</p>			3.974	4.055	4.312

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 2		R-1 Program Element (Number/Name) PE 0602234D8Z / Lincoln Laboratory	Project (Number/Name) 534 / Lincoln Laboratory		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
FY 2022 Plans: The focus of decision-making and teaming in complex environments will continue. Research will continue to improve current autonomous and AI-enabled system capabilities for air, land, sea, and cross-domain problem sets with the overall goal to develop more advanced autonomy, in-situ adaptation, and learning in changing, complex environments to reduce risk to warfighters and provide substantial operational advantages.					
FY 2023 Plans: The focus of decision-making and teaming in complex environments will continue; research will continue related to AI for autonomy, multi-agent systems, and trust and resilience.					
FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.					
Title: Quantum System Sciences			4.521	5.079	4.870
Description: This project area develops methods for sensing, communicating, and processing information using quantum mechanical manipulation not possible with classical computing techniques. Collaborating with major universities, quantum system science efforts are establishing a robust scientific foundation. On this foundation, application-oriented developments important for national security are being fostered.					
FY 2022 Plans: Future work in the program will focus on the underlying scientific and engineering issues of quantum system science. The Quantum System Sciences program will focus on other applied research topics in quantum information, including emerging modalities, interfaces between multiple quantum modalities, and quantum processing architectures.					
FY 2023 Plans: Future work in the program will focus on the underlying scientific and engineering issues of quantum system science. The Quantum System Sciences program will focus on other applied research topics in quantum sensing, quantum communications, and quantum computing.					
FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.					
Title: Advanced Materials and Processes			3.233	3.216	3.142
Description: This project area develops materials and processes that make a transformative impact on enduring national challenges. Areas of strategic focus are material property customization and material enablers for highly-integrated, miniature platform.					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 2		R-1 Program Element (Number/Name) PE 0602234D8Z / Lincoln Laboratory	Project (Number/Name) 534 / Lincoln Laboratory		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
FY 2022 Plans: The Advanced Materials and Process program will continue to conduct research on all forms of data-enhanced, computationally accelerated materials development, alongside a focus on advanced materials technologies that underpin small platforms. The program will continue to see the impact of multiscale, multi-material additive manufacturing, as well as other novel processes that combine materials in innovative ways, and expect these to have a major influence on DoD systems in the next few years.					
FY 2023 Plans: The Advanced Materials and Process program will continue to conduct research on all forms of data-enhanced, computationally accelerated materials development, alongside a focus on advanced materials technologies that underpin small platforms. Continued focus on the following areas: beyond CMOS electronics, materials for advanced sensors, integrated microstructures, and other advanced structures.					
FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.					
Title: Integrated Systems			4.693	5.236	6.620
Description: This project area combines multiple new technologies to solve important national needs. Projects selected for funding have an applied research component focused on integrated technology capability or technologies that facilitate greater levels of integrated capability. Projects target key DoD warfare domains, including space, air, land, sea surface, and undersea. The intent is to support early work on systems that cut across the conventional categories.					
FY 2022 Plans: The Integrated Systems program will continue to support projects that innovate at the system level through architecture, design, and/or introduction of new technologies. The projects will be those of strategic interest to the DoD and aligned with Lincoln Laboratory mission areas.					
FY 2023 Plans: The Integrated Systems program will continue to support projects that innovate at the system level through architecture, design, and/or introduction of new technologies from other line research areas. The projects will be those of strategic interest to the DoD and aligned with Lincoln Laboratory mission areas.					
FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.					
Title: Emerging Artificial Intelligence Capabilities			3.500	13.824	4.022
Description: This project area funds the emerging Artificial Intelligence (AI) needs of the DoD in addressing critical operational and research areas. The AI approach addresses both the immediate operational issues as well as the long-term research					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602234D8Z / <i>Lincoln Laboratory</i>	Project (Number/Name) 534 / <i>Lincoln Laboratory</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>requirements of the Department. However, significant gaps exist both in the ability to understand and apply AI at the tactical edge, democratized AI development across the Department, and use new AI approaches to improve the innovation ecosystem.</p> <p><i>FY 2022 Plans:</i> This project will explore engineering and training requirements for deploying and retraining machine learning tools at the tactical edge and demonstrating such capabilities in operationally relevant environments. Efforts will include the demonstration of collaborative AI at the Edge capability with our allies as well as a demonstration of agile command and control software/AI development, accelerating research through to experimentation. This project will also develop and demonstrate in an operational environment a standard development toolset to democratize AI development in the Department, including test and evaluation (T&E) toolsets for bias and adversarial AI vulnerability analysis. The project will also fund a challenge project to demonstrate accelerating Scientific Discovery through Artificial Intelligence.</p> <p><i>FY 2023 Plans:</i> This project will continue to explore engineering and training requirements for deploying and retraining machine learning tools at the tactical edge and demonstrating such capabilities in operationally relevant environments, as well as continuing to fund projects from FY 2022.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> FY 2022 increase for Emerging Artificial Intelligence Capabilities was for one year only.</p>			
Accomplishments/Planned Programs Subtotals		38.338	52.016
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602234D8Z / Lincoln Laboratory				Project (Number/Name) 815 / Cyber Security, Science and Engineering			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
815: Cyber Security, Science and Engineering	-	0.000	3.500	3.625	-	3.625	3.633	3.633	3.709	3.782	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Cyber Security, Science and Engineering research project focuses on the development of technologies and new techniques for the protection of systems against cyber- attack and exploitation. Efforts include research into technologies for cyber situational awareness, command and control; technology to improve resilience of systems to cyber-attack; and technologies for system exploitation research.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
<p>Title: Cyber Security, Science and Engineering</p> <p>Description: This project conducts research and development, including design, analysis, evaluation, and deployment, of prototype systems to improve the security of computer hardware, software, and networks. Its goal is to assure the resilience of Department of Defense (DoD) missions against cyber-attack and cyber-exploitation, with particular emphasis on the overlap between traditional Laboratory mission areas and the cyber domain.</p> <p>Ongoing efforts and areas of concentration include: foundational approaches for integrating traditional and cyber domains, tools and methods to compute threat-based cyber metrics, artificial intelligence (AI) and machine learning-based capabilities supporting cyber analysis and decision making, building trustworthy and resilient mission systems even with untrustworthy components, new cryptographic systems and prototypes, side-channel prevention and exploitation techniques in cyber and cyber-physical systems, and techniques for exploit repurposing.</p> <p>Integral to these efforts are demonstrations of the impact of cyber effects on traditional kinetic systems, the quantitative and repeatable evaluation of prototypes, and deployment of prototype technology to national-level exercises.</p> <p>The cyber security mission area uses line funding to research new cyber security techniques in anticipation of DoD and Intelligence Community (IC) needs and requirements.</p> <p>FY 2022 Plans: The Cyber Security, Science and Engineering program will continue to develop far-reaching cyber improvements that will significantly improve our interactions with the cyber world. The program will continue to extend the Resilient Mission Computer and Automatic Cryptographic Data-Centric Security projects and their successors to deliver game-changing cyber capabilities,</p>	-	3.500	3.625

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602234D8Z / <i>Lincoln Laboratory</i>	Project (Number/Name) 815 / <i>Cyber Security, Science and Engineering</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
further develop cyber exploitation and analytic capabilities, and continue to anticipate a future expansion to adversarial and offensive AI capabilities. <i>FY 2023 Plans:</i> The Cyber Security, Science and Engineering program will continue to develop far-reaching cyber improvements that will significantly improve our interactions with the cyber world. The program will continue to extend cyber applied research along the following strategic areas: cyber physical systems, cyber operations, resilient systems, and system exploitation. <i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> There is no significant change between FY 2022 and FY 2023.			
Accomplishments/Planned Programs Subtotals		-	3.500
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: Research, Development, Test & Evaluation, Defense-Wide I BA 2: Applied Research					PE 0602251D8Z I Applied Research for the Advancement of S&T Priorities							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	51.675	58.982	67.666	-	67.666	68.042	68.159	69.613	71.005	Continuing	Continuing
227: Applied Research for the Advancement of S&T Priorities	-	51.675	58.982	67.666	-	67.666	68.042	68.159	69.613	71.005	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Build Sustainable Advantage, Build a Resilient Joint Force and Defense Ecosystem, and Taking Care of People.

The Applied Research for the Advancement of Science and Technology (S&T) Priorities (ARAP) program builds a strong Department of Defense future workforce and infrastructure in critical emerging technology areas within the Under Secretary of Defense for Research and Engineering (USD(R&E)) Technology Vision for an Era of Competition to enable future leap-ahead capabilities that outpace our competitors. This program funds tri-Service applied researchers to work with university and industry partners, accelerating DoD learning and technology development for new capabilities. Programs continually have follow-on activities funded by the individual Services and Agencies, which reflects the overall value of the investment. Specific projects support the design, development, and improvement of immature technologies and new concepts to achieve general mission requirements and to translate promising research into solutions for military needs. In addition, the program enables concept exploration efforts and studies of alternative concepts. The research projects are aligned with the DoD S&T priorities and designated focus areas that include non-system specific technology efforts and feasibility assessments and are formulated and managed by teams of subject matter experts drawn from the Office of the Secretary of Defense, the Military Services, and the Defense Agencies. The program also provides support to the S&T Communities of Interest (Cols) multi-agency collaboration and coordination. The S&T Cols produce Joint S&T Roadmaps to contribute to the USD(R&E) Modernization Priority Roadmaps.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	53.359	65.015	0.000	0.000	0.000
Current President's Budget	51.675	58.982	67.666	0.000	67.666
Total Adjustments	-1.684	-6.033	67.666	0.000	67.666
• Congressional General Reductions	-	-5.828			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.674	-			
• Other Reprogramming	-0.010	-	-	-	-

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense					Date: April 2022	
Appropriation/Budget Activity			R-1 Program Element (Number/Name)			
0400: Research, Development, Test & Evaluation, Defense-Wide I BA 2: Applied Research			PE 0602251D8Z I Applied Research for the Advancement of S&T Priorities			
• FFRDC	-	-0.205	-	-	-	-
• Adjustments to Budget Year	-	-	65.332	-	-	65.332
• Economic Assumption	-	-	2.334	-	-	2.334
<u>Change Summary Explanation</u>						
In FY 2022, program reduced by \$5.828 million for unjustified growth.						
FY 2023 funding increase reflects the fact that the FY 2022 President’s Budget request did not include out-year funding.						

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602251D8Z / <i>Applied Research for the Advancement of S&T Priorities</i>				Project (Number/Name) 227 / <i>Applied Research for the Advancement of S&T Priorities</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
227: <i>Applied Research for the Advancement of S&T Priorities</i>	-	51.675	58.982	67.666	-	67.666	68.042	68.159	69.613	71.005	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Applied Research for the Advancement of Science and Technology (S&T) Priorities program was established to implement Department-wide technology development portfolios and foster tri-Service research areas of common interest within cross-cutting S&T efforts. The program has three investment areas: (1) large, three-year applied research programs selected by the S&T Executives; (2) smaller, two-year technology ‘seedling’ programs nominated by the S&T Communities of Interest (Cols) to address technology gaps or opportunities; and (3) support to the Cols. The execution of the program by the Office of the Secretary of Defense and the support it provides to the Cols assures joint strategic S&T oversight and multi-Service, multi-agency collaboration and coordination.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Applied Research for the Advancement of S&T Priorities (ARAP)	48.559	53.182	57.666
<p>Description: The program focuses on cross-cutting S&T efforts that foster tri-service research areas of common interest that give the joint warfighter a technological advantage. It focuses on emerging areas of science, building expertise within the DoD laboratories, including investment in laboratory infrastructure and people, and on research areas that are a foundation for further investments by the Services following the completion of the projects.</p> <p>Cross-cutting efforts are aligned with S&T Priorities, such as Electronic Warfare, Human Systems, Autonomy, Space, Kinetic Weapons, Directed Energy and Non-Lethal Weapons, Cyber, Sensors and Processing, Command, Control, Communications, Computers and Intelligence, Air Platforms, and Ground and Sea Platforms, as well other focus areas, such as Materials and Manufacturing Processes, Advanced Electronics, Energy and Power Technologies, Biotechnology, and Armed Services Biomedical Research Evaluation and Management.</p> <p>FY 2022 Plans: Complete Enhanced Energetic Effects (EEE): Transition new high energy propellant formulations to cost-competitive production lines. Complete Topologically-Enabled Devices (TEDs) (Year 3 of 3): Continue development of high-speed ultra-low-power electronics and photodetectors with new spin-polarized topological electronics and magnetic materials. Continue A Combined Development Pipeline for Novel Neuromorphic Hardware (NeuroPipe) (Year 2 of 3): Design and fabricate first neuromorphic processor in a foundry using Complementary Metal-Oxide Semiconductor (CMOS) “neurons” as a key component for artificial intelligence dominance.</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602251D8Z / <i>Applied Research for the Advancement of S&T Priorities</i>	Project (Number/Name) 227 / <i>Applied Research for the Advancement of S&T Priorities</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>Initiate Surface Morphing and Adaptive Structures for Hypersonics (SMASH) (Year 1 of 3): Begin developing methods to extend the speed and range of hypersonics by addressing five technical areas to increase the lift/drag ratio: surface morphing, materials and material processing, actuation and maneuverability, trajectory simulation, and electromagnetic analysis.</p> <p>FY 2023 Plans: Complete A Combined Development Pipeline for Novel Neuromorphic Hardware (NeuroPipe) (Year 3 of 3): Demonstrate on-chip dynamic learning software (i.e. learning after training) with a low-power radiation-hard neuromorphic processor. Transition viable materials to commercial on-shore fabrication prototypes.</p> <p>Continue Surface Morphing and Adaptive Structures for Hypersonics (SMASH) (Year 2 of 3): Conduct wind tunnel testing that demonstrates initial concepts to significantly extend the speed, range, and maneuverability of hypersonics.</p> <p>Initiate new ARAP project to be selected in third quarter FY 2022.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Changes reflect increase in execution after COVID-related delays.</p>			
<p>Title: S&T Communities of Interest (Cols)</p> <p>Description: The S&T Cols facilitate coordination and collaboration across Components to reduce duplication and optimize the development of critical S&T efforts across the DoD enterprise. Their efforts include the development of joint S&T roadmaps and the planning of technology integration. The Cols assess and address capability gaps and their multi-domain operational impact.</p> <p>FY 2022 Plans: Continue to provide support to the Cols, i.e., Advanced Electronics; Air Platforms; Autonomy; Armed Services Biomedical Research Evaluation and Management. Biotechnology; Command, Control, Communications, Computers, and Intelligence (C4I); Cyber; Directed Energy - Non-Lethal Weapons; Electronic Warfare; Energy and Power; Ground and Sea Platforms; Human Systems; Kinetic Weapons; Materials and Manufacturing Processes; Sensors and Processing; and Space.</p> <p>FY 2023 Plans: Continue to provide support to the Cols, i.e., Advanced Electronics; Air Platforms; Autonomy; Armed Services Biomedical Research Evaluation and Management. Biotechnology; Command, Control, Communications, Computers, and Intelligence (C4I); Cyber; Directed Energy - Non-Lethal Weapons; Electronic Warfare; Energy and Power; Ground and Sea Platforms; Human Systems; Kinetic Weapons; Materials and Manufacturing Processes; Sensors and Processing; and Space.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>		3.116	4.800
			5.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602251D8Z / <i>Applied Research for the Advancement of S&T Priorities</i>	Project (Number/Name) 227 / <i>Applied Research for the Advancement of S&T Priorities</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
There is no significant change between FY 2022 and FY 2023.			
Title: Power Thermal Management Description: The program focuses on cross-cutting power and thermal Applied Research efforts that enable integration of high-power and high-energy mission systems on platforms. Unlike conventional kinetic weapons, large heat loads generated from large electrical currents will limit high-power laser and microwave performance on future envisioned DoD platforms. The program pursues solutions to challenges or gaps in power and thermal technologies, research areas and DoD laboratory expertise, including investment in laboratory infrastructure and people, that are a foundation for platform-integrated and fielded capability. Cross-cutting efforts include power and thermal technologies and subcomponents that support more than one domain (air, sea, land, or space) or address power and thermal technologies required for standardization to broadly realize capability across multiple platforms. FY 2022 Plans: Investigate and mature technologies that enable cross-domain solutions for large-scale energy storage on platforms in a manner that is safe and scalable and delivers power and energy densities appropriate for advanced mission systems. Support cross-domain modeling of power and thermal architecture necessary to assess challenges and advance emerging thermal technologies that enable advanced mission systems. FY 2023 Plans: Start multiple seedlings for non-kinetic effects. Conduct applied research to operate wideband sensors on DoD platforms at the intersection of cyber space, electronic warfare, radar, and communications using the speed of artificial intelligence to provide non-escalatory engagement options. FY 2022 to FY 2023 Increase/Decrease Statement: Increase supports development of non-kinetic effects that OUSD(R&E) has identified as a critical technology area.		-	1.000
			5.000
Accomplishments/Planned Programs Subtotals		51.675	58.982
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 2: Applied Research</i>					R-1 Program Element (Number/Name) PE 0602668D8Z I <i>Cyber Security Research</i>							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	24.328	25.331	17.264	0.000	17.264	17.744	18.115	18.510	18.881	Continuing	Continuing
003: <i>Cyber Applied Research</i>	-	24.328	25.331	17.264	0.000	17.264	17.744	18.115	18.510	18.881	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Defend the Homeland and Build Sustainable and Long-Term Advantage.

The Cyber Security Applied Research program element promotes innovative higher risk cyber research to meet joint force challenges in full spectrum cyber operations. The program addresses joint Service science and technology (S&T) gaps that influence DoD cyber research priorities and shapes the direction of the wider cyber community. The program integrates both defensive and offensive cyber research to develop interchangeable, defense-wide technology options to meet Combatant Command (CCMD) needs and requirements. To better align itself to the National Defense Strategy (NDS), Department of Defense (DoD) Cyber Strategy, and Office of Under Secretary of Defense for Research and Engineering (OUSD(R&E)) strategic cyber capability goals, the program recalibrated research thrust areas to emphasize the role of electromagnetic spectrum operations (EMSO) and artificial intelligence as key enablers for cyber power projection of scale, speed, and dominance. The established research thrusts areas are: Behavioral Cyber Applied Research, Self-Securing Systems, Precise Cyber-EMSO Effects, and Applied Mathematics for Cyber.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	25.245	15.380	0.000	0.000	0.000
Current President's Budget	24.328	25.331	17.264	0.000	17.264
Total Adjustments	-0.917	9.951	17.264	0.000	17.264
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	10.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.912	-			
• Other Reprogramming	-0.005	-	-	-	-
• FFRDC	-	-0.049	-	-	-
• Adjustments to Budget Year	-	-	16.668	-	16.668
• Economic Assumption	-	-	0.596	-	0.596

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 2: Applied Research</i>		R-1 Program Element (Number/Name) PE 0602668D8Z I <i>Cyber Security Research</i>	
<u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u>		FY 2021	FY 2022
Project: 003: <i>Cyber Applied Research</i>			
Congressional Add: <i>Cyber Institutes at Institutions of Higher Learning</i>		10.000	10.000
Congressional Add Subtotals for Project: 003		10.000	10.000
Congressional Add Totals for all Projects		10.000	10.000
<u>Change Summary Explanation</u>			
FY 2022 funding increase reflects \$10.000 million Congressional add for Academic Cyber Institutes.			
FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602668D8Z / Cyber Security Research				Project (Number/Name) 003 / Cyber Applied Research			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
003: Cyber Applied Research	-	24.328	25.331	17.264	0.000	17.264	17.744	18.115	18.510	18.881	Continuing	Continuing

A. Mission Description and Budget Item Justification

Adversaries are increasingly leveling the cyber playing field by harnessing commoditized and affordable cyber tools and capabilities, while developing sophisticated and automated technologies and tactics. The DoD cyber S&T community must accelerate the pace of innovative research accordingly to maintain technological advantage. The 2018 National Defense Strategy (NDS) recognized cyber as an actively contested domain with significant security challenges and potential leap-ahead capabilities for military operations. This was further reinforced by the establishment of Cyber as one of USD(R&E) Modernization Areas in 2018, the development of the USD(R&E) S&T Strategy for Cyber, and the 2021 Interim National Security Strategic Guidance.

This program element focuses on higher risk research ideas with major potential impact for addressing NDS and Modernization mission focus areas of cybersecurity. The program works to advance the state of cybersecurity by reducing risk, broadening applicability, and accelerating research in the areas of Behavioral Cyber Applied Research; Self-Securing Systems; Precise Cyber-EMSO Effects; and Applied Mathematics for Cyber. Advances in these cyber S&T thrusts will promote strong foundations, while disruptive innovations will create surprise, shape the fight, and ensure a decisive advantage. The thrusts are critical to the development of innovative and sustainable research that takes cybersecurity beyond the incremental escalation of attack and defense. The thrusts provide an opportunity to identify and advance foundational technologies to support all Services and Agencies.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: OUSD(R&E) Cyber Technologies	14.328	15.331	17.264
Description: Integrating both defensive and offensive innovative cyber research within the DoD cyber science and technology (S&T) enterprise to develop interoperable, defense-wide technology options that address joint force challenges in full spectrum cyber operations.			
Behavioral Cyber Applied Research: Advances understanding and technical rigor of modeling and predicting human responses to cyber activities that enhance cyber operations through planning and training. Explores the interaction between computers and human behavior, moving beyond electronic signals (ones and zeroes) to enable development of new insights to human behavior, resistance to adversarial cyber influence, and cyber situational awareness.			
Self-Securing Systems: System, platforms, and networks will autonomously help DoD operators react more quickly to cyber-attacks. Equips future DoD systems with the capability to proactively, autonomously, and seamlessly access cyber threats and deploy self-securing mechanisms to neutralize cyber-attacks, offers blue force an innovative new disruptive capability.			
Precise Cyber-EMSO Effects: Provides scalable cyber options for military cyber commanders, to precisely identify and engage specific threats and targets with a high confidence of success. Identifies early cyber-EMSO integration opportunities and			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 2		R-1 Program Element (Number/Name) PE 0602668D8Z / <i>Cyber Security Research</i>		Project (Number/Name) 003 / <i>Cyber Applied Research</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>advances technology to support future prototypes and assessments. Provides a disproportionate advantage for cyber operational modeling, within high variability architectures. These advantages impact industrial control systems and critical infrastructures across blue, gray, and red spaces.</p> <p>Applied Mathematics for Cyber: Advancements in cyberspace-relevant mathematics such as machine learning and artificial intelligence cut across all three thrust areas producing new provable methods to design, secure, and reason about complex cyber systems. There is a need for an array of formal and informal modeling techniques, backed by various rigorous mathematical theories, to capture and support the richness of the cyber domain. These collective capabilities are fundamentally crucial for DoD to achieve dominance in cyber situation awareness, decision-making, and automated implementation of courses of action.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> - Complete projects initiated in FY 2021, as well as initiate new projects that consider the implication of the NDAA FY 2021 Section 257 DoD 25-Year Roadmap for Cyber. These efforts will explore challenges in applied research topics, such as Artificial Intelligence/Machine Learning; Countering Adversarial Machine Learning; Exploring Precise Cyber-EMSO Effects at the tactical edge; and DoD cyber work force operational planning and execution, training, and education. <p>Self-Securing Systems:</p> <ul style="list-style-type: none"> - Design and develop intrusion prevention systems with technologies that support ground vehicle cybersecurity, while employing critical technology focusing on peer to near-peer threats. Integrate DoD cybersecurity S&T investment areas in order to address shortfalls, gaps and accelerate/advance results for adaptation and insertion into military and commercial platforms and supply chains. Impact: The process will help meet the Department's goal of rapidly fielding software and hardware to serve as a trust foundation, resulting in increasingly cyber resilient systems, while building solutions for sustainment of supply chain security. <p>Precise Cyber-EMSO Effects:</p> <ul style="list-style-type: none"> - Enhance ongoing Critical Infrastructure Protection cyber research to reduce uncertainty surrounding predicted effect types and their measured magnitudes within electrical energy distribution networks. - Refine 5G vulnerability analysis framework to more precisely assess blue 5G systems and rapidly identify vulnerabilities within 5G core and radio access network software. Develop prototype 5G effects framework suitable for experimentation and assessment. Impact: Clear understanding of impact and risk of using 5G core services for specific DoD capabilities. Prototype 5G effects framework whose technology will be transitioned to the 16th Air Force for future enhancement. <p>Behavioral Cyber Applied Research:</p> <ul style="list-style-type: none"> - Complete Contextualized Operator Perspective project. Demonstrate to USCYBERCOM and other stakeholders, with intent to technically transition into Joint Cyber Command and Control program. 					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 2		R-1 Program Element (Number/Name) PE 0602668D8Z / Cyber Security Research	Project (Number/Name) 003 / Cyber Applied Research		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>- Release a call for targeted proposals for creating new insights to increase effectiveness of tools, cyber workforce, and cyber solutions for large scale DoD operations. Impact: Increase tempo, scale, and complexity of cyber operations via increased operator efficiency.</p> <p>Applied Mathematics for Cyber:</p> <p>- Complete projects initiated in FY 2021, as well as initiate new projects that consider the implication of the Cyber Roadmap Working Group’s report on the NDAA FY 2020 Section 257 DoD 25-Year Roadmap for Cyber. These efforts will explore challenges in applied research topics, such as Artificial Intelligence/Machine Learning; Countering Adversarial Machine Learning; Exploring Precise Cyber-EMSO Effects at the tactical edge; and DoD cyber work force operational planning and execution, training, and education.</p> <p>Self-Securing Systems:</p> <p>- Design and develop intrusion prevention systems with technologies that support ground vehicle cybersecurity, while employing critical technology focusing on peer to near-peer threats. Integrate DoD cybersecurity S&T investment areas in order to address shortfalls, gaps and accelerate/advance results for adaptation and insertion into military and commercial platforms and supply chains. Impact: The process will help meet the Department's goal of rapidly fielding software and hardware to serve as a trust foundation, resulting in increasingly cyber resilient systems, while building solutions for sustainment of supply chain security.</p> <p>Precise Cyber-EMSO Effects:</p> <p>- Enhance on going Critical Infrastructure Protection cyber research to reduce uncertainty surrounding predicted effect types and their measured magnitudes within electrical energy distribution networks.</p> <p>- Refine 5G vulnerability analysis framework to more precisely assess blue 5G systems and rapidly identify vulnerabilities within 5G core and radio access network software. Develop prototype 5G effects framework suitable for experimentation and assessment. Impact: Clear understanding of impact and risk of using 5G core services for specific DoD capabilities. Prototype 5G effects framework whose technology will be transitioned to the 16th Air Force for future enhancement.</p> <p>Behavioral Cyber Applied Research:</p> <p>- Complete Contextualized Operator Perspective project. Demonstrate to USCYBERCOM and other stakeholders, with intent to technically transition into Joint Cyber Command and Control program.</p> <p>- Release a call for targeted proposals for creating new insights to increase effectiveness of tools, cyber workforce, and cyber solutions for large scale DoD operations. Impact: Increase tempo, scale, and complexity of cyber operations via increased operator efficiency.</p> <p>Applied Mathematics for Cyber:</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 2		R-1 Program Element (Number/Name) PE 0602668D8Z / <i>Cyber Security Research</i>		Project (Number/Name) 003 / <i>Cyber Applied Research</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> - Develop a novel technique for integrating formal methods into a modern DevSecOps development process, reduce certification risk by piloting methods on DoD Platform One, and validate with the Navy's Strategic Systems Program. Impact: Increase the speed and rigor of cybersecurity analysis within Air Force and Navy DevSecOps processes. - Develop lab-based prototype system to measure the cyber-resilience of military vehicle systems, with Army's Combat Capabilities Development Command (CCDC), Army Research Laboratory (ARL). - Develop a proof-of-concept system for AI-powered automated mitigations to counter-autonomy threats associated with robotic and autonomous system cybersecurity attacks with contribution from Cybersecurity for Robotic & Autonomous Systems Hardening and Joint Capability Technology Demonstrations. Impact: Reduces cyber risk to Cybersecurity for Robotic & Autonomous Systems Hardening (CRASH) Joint Capability Technology Demonstrations (JCTD) by providing quantifiable and repeatable measures for mission resilience to guide development or assessment decisions also rapidly fielding software and hardware. <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Revector Cyber PE investments consistent with the updated 2022 National Defense Strategy and anticipated DoD Cyber Strategy. Consider revision of four main thrust areas, Behavioral Cyber Applied Research, Self-Securing Systems, Precise Cyber-EMSO Effects, and Applied Mathematics for Cyber, if needed. - Emphasize the early and deep integration and acceleration of Cyber and Electromagnetic Spectrum Operations (EMSO) S&T capabilities within the Services and Components. Complete Cyber-EMSO integration opportunity roadmap. Complete Cyber-EMSO S&T Landscape Analysis and Roadmap. - Fund and accelerate select Cyber-EMSO integrated concepts that project power through the Information, Cyber, and Spectrum domains in tight coordination, leveraging Internet of Things opportunities. - Transition automated Fifth Generation (5G) core vulnerability analysis capabilities to 16th Air Force and other DoD organizations. - Continue completion of FY 2022 projects in the areas of Applied Mathematics for Cyber and Behavioral Cyber Applied Research thrust areas. - Deliver engagement strategy and roadmap for DoD to engage ground vehicle Original Equipment Manufacturers for transition of DoD automated resilience technologies. - Launch new S&T exploring security concerns within cellular Sixth Generation (6G) standards. - Transition automated Fifth Generation (5G) core vulnerability analysis capabilities to 16th Air Force and other DoD organizations. - Continue completion of FY 2022 projects in the areas of Applied Mathematics for Cyber and Behavioral Cyber Applied Research thrust areas. - Deliver engagement strategy and roadmap for DoD to engage ground vehicle Original Equipment Manufacturers for transition of DoD automated resilience technologies. - Launch new S&T exploring security concerns within cellular Sixth Generation (6G) standards. <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602668D8Z / <i>Cyber Security Research</i>	Project (Number/Name) 003 / <i>Cyber Applied Research</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
The additional resources will be used to strategically target new investments areas aligned with the National Defense Strategy and DoD Cyber Strategy for FY 2022.			
Accomplishments/Planned Programs Subtotals		14.328	17.264
	FY 2021	FY 2022	
Congressional Add: Cyber Institutes at Institutions of Higher Learning	10.000	10.000	
FY 2021 Accomplishments: - Completed sub-awards for FY 2020 VICEROY Institutes cohort by 2Q FY 2021. The cross service/component source selection team evaluated proposals to identify top candidates under the first tranche of funding, with execution beginning in 3Q FY 2021. - Developed and released a solicitation for FY 2021 proposals from higher learning institutes interested in joining the virtual cyber institutes cohort. Posted solicitation in 2Q FY 2021 with the goal of completing the sub-awards in 3Q FY 2021. - Convened first VICEROY symposium in 4Q FY 2021 to connect virtual institute member organizations with the DoD governance board FY 2022 Plans: - Complete source selection for next cohort of awards in December 2021, with sub-awards for three new VICEROY institutes anticipated to be finalized in early April 2022. - The Air Force Research Laboratory's Information Directorate will host VICEROY's first, eight Week "Introduction to Cyber" summer internship program. - The VICEROY program management team will continue to work with Congress and awarded schools to identify opportunities to expand the program, accelerate expenditure of funding, and provide longer-term student support.			
Congressional Adds Subtotals	10.000	10.000	
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: Research, Development, Test & Evaluation, Defense-Wide / BA 2: Applied Research					PE 0602675D8Z / Social Science Research for Climate and Environmental Change							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	4.000	-	4.000	4.800	5.600	6.200	6.500	Continuing	Continuing
046: Providing Research and End-user Products to Accelerate Readiness and Environmental Security (PREPARES)	-	0.000	0.000	4.000	-	4.000	4.800	5.600	6.200	6.500	Continuing	Continuing

Note

New Start (Y/N): Yes

A. Mission Description and Budget Item Justification

This program funds Department of Defense physical climate and social science applied research. Climate and environmental change will impact the full range of U.S. military operating environments. DoD capabilities, until recently, have been aligned toward the historical environmental and geopolitical record; failure to anticipate and plan for the security effects of climate and environmental change holds significant potential to not only degrade DoD readiness and effectiveness but also compound the frequency and scope of novel geostrategic risks and surprises. Efforts under this program will focus on interdisciplinary science and technology that spans physical climate modeling and forecasting and social sciences capable of yielding tangible decision support tools that empower operational planners to prepare for and adapt to the complicated, interconnected security and stability challenges of climate and environmental change. Insights derived from this program will enable Combatant Commands to better engage key partners and allies in efforts to plan for and mitigate risks and promote global peace and stability.

This program is in Budget Activity 2, Applied Research because this budget activity includes studies, investigations, and non-system specific technology efforts directed toward general military needs with a view toward developing and evaluating the feasibility and practicality of proposed solutions and determining their parameters.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	4.000	-	4.000
Total Adjustments	0.000	0.000	4.000	-	4.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Year	-	-	4.000	-	4.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 2: Applied Research		R-1 Program Element (Number/Name) PE 0602675D8Z / Social Science Research for Climate and Environmental Change
<p><u>Change Summary Explanation</u></p> <p>FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.</p> <p>Providing Research and End-user Products to Accelerate Readiness and Environmental Security (PREPARES) is a new start in FY 2023.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602675D8Z / Social Science Research for Climate and Environmental Change				Project (Number/Name) 046 / Providing Research and End-user Products to Accelerate Readiness and Environmental Security (PREPARES)			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
046: Providing Research and End-user Products to Accelerate Readiness and Environmental Security (PREPARES)	-	0.000	0.000	4.000	-	4.000	4.800	5.600	6.200	6.500	Continuing	Continuing

Note
New Start (Y/N): Yes

A. Mission Description and Budget Item Justification
This program will leverage and integrate expertise from operational end users, physical climate scientists and models, tools, and datasets, and social scientists with deep understanding of designated regional and local communities to anticipate and respond more quickly and precisely to climate and environmental change risks and opportunities. The program aims to explore how specific environmental and social indicators might inform strategic reviews to adapt warfighter training and planning in anticipation of climate global trends. The research program will build upon the products of the 6.1 Minerva Research Initiative with a focus on end-user defined mission, geographic, and timescale priorities to forecast local and regional climate and environmental change effects, assess and predict likely societal impacts and responses, and ultimately provide operations planners technically-relevant and operationally precise scenarios to incorporate into CONPLANS and OPLANS and ISR requirements related to climate change.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Title: Providing Research and End-user Products to Accelerate Readiness and Environmental Security (PREPARES) Description: PREPARES will leverage and build upon Minerva products by incorporating their findings into operationally-relevant planning scenarios that accelerate the Department's understanding of the social, cultural, behavioral, and political dynamics most likely to be affected by climate and environmental change in strategically important areas of the world. By aligning research objectives with the priorities of operational end users who can apply the tools and knowledge products to their areas of responsibility, the proposed enhancement would translate and integrate results from 6.1 strategic and global-centric analyses to provide operational and tactical assessments to inform CONPLANS and OPLANS, focusing on specific regions and detailed scenarios for the warfighter. PREPARES uniquely applies research to integrate physical climate and social sciences and accelerate "research to operations", directly impacting military operational planning and preparations to mitigate the security risks from climate and environmental change. This effort also will rapidly produce the tools and products the end-users need to sustain data-informed planning and analysis for operations and engagements with partners and allies. FY 2023 Plans:	-	-	4.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 2		R-1 Program Element (Number/Name) PE 0602675D8Z / <i>Social Science Research for Climate and Environmental Change</i>		Project (Number/Name) 046 / <i>Providing Research and End-user Products to Accelerate Readiness and Environmental Security (PREPARES)</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>Activities for this first year will include those items necessary for establishing the program, including: creation of an advisory team, governing body and project guidance and execution documentation; identification of priority scenarios for exploration; and selection of performers and initiation of modeling and social science research efforts.</p> <p>To demonstrate technical feasibility and relevance to operational end-users, PREPARES initially will focus on several issues related to climate and environmental change security challenges that are of importance to and identified by the SOCOM Enterprise, affected commands, and operational elements, including Civil Affairs operational planners. For FY 2023, the program will initiate focused research into including – but not limited to – one or more of the following areas identified by the Combatant Command end users:</p> <ul style="list-style-type: none"> (1) Development of data-driven, spatially explicit forecasts of where climate and environmental change risks and opportunities exist now and will occur in the near future, their types, and the dynamics within each; (2) Understanding the sociocultural tensions in a given theater as a result of perceptions of disproportionate climate and environmental change impacts, including shifts in opportunities and challenges; (3) How socioeconomic interdependence and burden sharing to manage climate and environmental change challenges may affect the roles and relationships of DoD alliances and those of our competitors; (4) Assessments of the ability of state and non-state groups to organize, mobilize, strategize, govern, and gain advantage in the face of climate and environmental change and the locations of where this may occur due to pre-existing instabilities and/or other existing risk factors; (5) How climate and environmental change may be leveraged by specific actors in power competition and the emergence of critical threats in contested regions; (6) How climate and environmental change may impact, influence, and interact with other compounding risk factors, including social, political, and economic dynamics; (7) The development of integrated tools and data products (e.g., data-driven scenarios, social-ecological systems models, remote and in-situ observations, statistical guidance) to forecast the emergence of physical phenomenon at relevant time and spatial scales in the context of their sociocultural settings; and (8) Using the aforementioned research topics to rapidly establish an end-user product for decision support and potential early warnings of threats (through precise indicators) so as to guide planning and/or response before such threat impacts defense effectiveness. <p>FY 2022 to FY 2023 Increase/Decrease Statement: PREPARES is a new start for FY 2023.</p>					
Accomplishments/Planned Programs Subtotals			-	-	4.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602675D8Z / <i>Social Science Research for Climate and Environmental Change</i>	Project (Number/Name) 046 / <i>Providing Research and End-user Products to Accelerate Readiness and Environmental Security (PREPARES)</i>
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy NA		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 2: Applied Research</i>	PE 0602751D8Z / <i>Software Engineering Institute (SEI) Applied Research</i>											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	9.216	9.571	11.030	0.000	11.030	11.365	11.607	11.867	12.105	Continuing	Continuing
278: <i>Software Engineering Institute (SEI) Applied Research</i>	-	9.216	8.627	10.097	0.000	10.097	10.417	10.665	10.904	11.122	Continuing	Continuing
817: <i>Cyber Security, Applied Research</i>	-	0.000	0.944	0.933	0.000	0.933	0.948	0.942	0.963	0.983	Continuing	Continuing

Note

New Start (Y/N): No

The Software Engineering Institute (SEI) Applied Research Program Element (PE) develops and evaluates the feasibility and practicality of software and computer science concepts at the applied research level, with the potential to improve future DoD systems through research, development, and application in the SEI Advanced Technology Development Program Element (PE) 0603781D8Z. Promising projects proceed into advanced technology development through this PE.

A. Mission Description and Budget Item Justification

This program supports the Department's initiative to Build Sustainable and Long-Term Advantage.

The Software Engineering Institute (SEI) Federally Funded Research and Development Center (FFRDC) was established in 1984 as an integral part of the DoD's initiative to identify, evaluate, and transition software engineering technologies and practices. The mission of the SEI is to provide the DoD with technical leadership and innovation through research and development to advance the practice of software engineering and technology. The SEI works across government, industry, and academia to improve the state of software engineering from the technical, acquisition, and management perspectives. The SEI engages in research and development of critical software technologies and tools and collaborates with the larger software engineering research community. It facilitates the rapid transition of software engineering technologies into practice and evaluates emerging software engineering technologies to determine their potential for improving software-intensive Department of Defense (DoD) systems. Since its inception, the SEI has helped to transform the fields of software engineering and acquisition, network security, real-time systems, software architectures, and software-engineering process management.

Software is critical to meeting the Department of Defense's (DoD) increasing demand for national defense systems that are high quality, affordable, and deployed in a timely way. With growing global parity in software engineering, the DoD must maintain leadership in all aspects of software-based system development, operation, defense, and evolution to avoid strategic surprise. To assist the DoD in retaining a long-term differential advantage over potential adversaries, the Software Engineering Institute (SEI) Applied Research program element (PE) develops and evaluates the feasibility and practicality of software and computer science concepts, with the potential to improve future DoD systems. The research conducted by this PE directly benefits the technical domains Autonomous Systems and Artificial Intelligence (AI), Cyber, and Engineered Resilient Systems.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 0602751D8Z I <i>Software Engineering Institute (SEI) Applied Research</i>
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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	9.567	9.601	0.000	-	0.000
Current President's Budget	9.216	9.571	11.030	-	11.030
Total Adjustments	-0.351	-0.030	11.030	-	11.030
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.349	-			
• Other Reprogramming	-0.002	-	-	-	-
• FFRDC	-	-0.030	-	-	-
• Adjustments to Budget Year	-	-	10.650	-	10.650
• Economic Assumption	-	-	0.380	-	0.380

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602751D8Z / Software Engineering Ins titute (SEI) Applied Research				Project (Number/Name) 278 / Software Engineering Institute (SEI) Applied Research			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
278: Software Engineering Institute (SEI) Applied Research	-	9.216	8.627	10.097	0.000	10.097	10.417	10.665	10.904	11.122	Continuing	Continuing

A. Mission Description and Budget Item Justification

Work conducted under this Program Element (PE) will enable resilient mission assurance in heterogeneous and contested environments through the verification and validation of system performance and architecture. The program will also assist the Department of Defense (DoD) in retaining a long-term advantage in the areas of software-intensive systems and cyber security by enhancing assurance, exploiting automation and Artificial Intelligence (AI), and understanding human-computer interaction.

The Software Engineering Institute (SEI) Applied Research PE has two main research thrusts with known military applications: (1) Software Engineering, Systems Verification and Validation, and Mission Assurance (formerly Mission Assurance); and (2) Information Assurance. This area is increasingly being applied to AI and autonomous systems.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>Title: SEI Applied Research in the Area of Software Engineering, Systems Verification and Validation, and Mission Assurance (formerly Mission Assurance)</p> <p>Description: Increasingly complex and AI-enabled systems will require a commensurate increase in sophistication of verification and validation mechanisms. This thrust seeks to develop verification techniques for requirements identification, systems of systems architectures, and virtual integration of components. Additionally, research in this area will enable requirements verification for software assurance, analysis and control of unverified code, and automated repair of damaged code. Software production and code analysis methods developed through this program will also improve the accuracy of behavior prediction of complex software, including AI-enabled systems, in untested environments.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none">Develop new techniques to give Machine Learning (ML) models the ability to express when they are likely to be wrong without drastically increasing the computational burden during training. <p>FY 2023 Plans:</p> <ul style="list-style-type: none">Develop new techniques to allow feedback between deployed software, software modeled through model based systems engineering, and deployed systems. This approach can be automated using machine learning methods that enable comparison of online information systems performance with modeled systems performance in a variety of mission and application contexts. <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>	6.666	6.036	7.492

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense									Date: April 2022		
Appropriation/Budget Activity 0400 / 2				R-1 Program Element (Number/Name) PE 0602751D8Z / Software Engineering Ins titute (SEI) Applied Research				Project (Number/Name) 278 / Software Engineering Institute (SEI) Applied Research			
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023
The additional resources will be needed to further develop methods and tools for software assurance, augmenting machine learning.											
Title: SEI Applied Research in the areas of Information Assurance (IA)									2.550	2.591	2.605
Description: To gain full advantage from data and information generated by software for use in missions, DoD needs to assure its software is free of vulnerabilities. In its complex systems, DoD may use software developed from an unknown supply chain that may include intentionally or unintentionally introduced vulnerabilities. This thrust seeks to develop scalable automated methods to locate, understand, and mitigate the effects of these vulnerabilities. Automated solutions developed through this thrust will be used to discover vulnerabilities in system software source code and to generate proofs of correctness or fault. Additionally, these solutions will be used to model and simulate operational environments to support software and cyber tactics, techniques, and procedures testing.											
FY 2022 Plans:											
• Use machine learning and semantic analysis of data generated during Continuous Integration/Continuous Delivery to reduce the number of alerts requiring human adjudication during the deployment of multiple situational awareness tools and increase the security of software without slowing the development process.											
FY 2023 Plans:											
• Enable verification and validation of systems at the embedded level through graph based models of embedded systems performance and integration of large collections of such embedded systems on complex command and control applications.											
FY 2022 to FY 2023 Increase/Decrease Statement:											
There is no significant change between FY 2022 and FY 2023.											
Accomplishments/Planned Programs Subtotals									9.216	8.627	10.097
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• RDT&E, BA 3, PE 0603781D8Z: Software Engineering Institute	12.128	14.631	13.417	0.000	13.417	16.993	17.427	17.829	18.186	Continuing	Continuing
Remarks											
The SEI Applied Research PE represents a pivot toward more fundamental research that enables the DoD to address longer-term challenges in software technology and engineering. The SEI Applied Research PE bolsters the organic research at the SEI Federally Funded Research and Development Center (FFRDC), enables											

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602751D8Z / Software Engineering Ins titute (SEI) Applied Research	Project (Number/Name) 278 / Software Engineering Institute (SEI) Applied Research	

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
stronger collaborations between the SEI FFRDC and academia, attracts top researchers to the SEI, and gives the DoD access to top experts in information science, which generally enhances the DoD’s ability to benefit from the military applications of research in software and computer science.											

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602751D8Z / Software Engineering Ins titute (SEI) Applied Research				Project (Number/Name) 817 / Cyber Security, Applied Research			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
817: Cyber Security, Applied Research	-	0.000	0.944	0.933	0.000	0.933	0.948	0.942	0.963	0.983	Continuing	Continuing

A. Mission Description and Budget Item Justification

Work conducted under this project will enable resilient mission assurance in heterogeneous and contested environments through the verification and validation of system performance and architecture. The program will also assist the DoD in retaining a long-term advantage in the area of cybersecurity by enhancing assurance, exploiting automation, and understanding human-computer interaction.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>Title: Cyber Security</p> <p>Description: Warfighting in the cyber domain often operates at sub-second timescales and across multiple domains of authority. Methods used to accomplish many tasks (e.g., malware analysis, coordinating multiple agents) demand large amounts of time, attention, and special skills and are not scalable. This thrust seeks to develop and increase the use of automation to simplify the completion of these tasks. Example activities include automation of moving target defenses, code artifact reverse engineering, analysis of network flows at enterprise scale, assessing the operating boundaries for Artificial Intelligence (AI) and Machine Learning (ML) algorithms, and development and assessment of workforce skills.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> • Improve emulation and virtualization techniques to advance understanding of – and defense capabilities against – adversary attacks. <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> • Improve emulation and virtualization techniques to advance understanding of – and defense capabilities against – adversary attacks. <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p> <p>There is no significant change between FY 2022 and FY 2023.</p>	-	0.944	0.933
Accomplishments/Planned Programs Subtotals	-	0.944	0.933

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602751D8Z / <i>Software Engineering Ins</i> <i>tute (SEI) Applied Research</i>	Project (Number/Name) 817 / <i>Cyber Security, Applied Research</i>
D. Acquisition Strategy N/A		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: Research, Development, Test & Evaluation, Defense-Wide I BA 2: Applied Research					PE 0602890D8Z I High Energy Laser Development							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	45.852	48.587	0.000	48.587	49.663	50.673	51.711	52.745	Continuing	Continuing
890: High Energy Laser Development	0.000	0.000	45.852	48.587	0.000	48.587	49.663	50.673	51.711	52.745	Continuing	Continuing

Note

New Start (Y/N): No

In order to better align resources and program management to functional, organizational sponsorship, the High Energy Laser Research Initiatives program has transferred from the Air Force (PE 0602890D8Z) to the Office of the Secretary of Defense starting in FY 2022. This Program will focus on Applied Research for Directed Energy (DE) technologies divided into the following areas: (1) DE Sources; (2) Beam Control; (3) Lethality and Vulnerability; and (4) Power and Thermal Management to reflect the OSD S&T priorities for Directed Energy.

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Defend the Homeland, Deter Aggression and Prevail in Conflict, and Build Sustainable and Long-Term Advantage.

This program funds Department of Defense Directed Energy applied research through the Joint Directed Energy Transition Office. This program is part of an overall Department of Defense Directed Energy Science and Technology program. DE weapons systems have many potential advantages, including speed-of-light time-to-target, high precision, low incremental cost per kill, and a magazine that is recharged through on-board, fuel-based power and thermal management systems that reduce logistics requirements in contrast to stocks of munitions or warheads. Directed Energy weapon systems have the potential to perform a wide variety of military missions, including high value asset and base protection, precision strike and platform self-protection versus a wide variety of missile, rocket, artillery, mortar and air platforms. Efforts under this program are generally chosen for their potential to have an impact on multiple Directed Energy weapon systems and multiple Service missions while complementing Service efforts that are directed for specific service needs. A broad range of technologies are addressed in key areas, such as laser sources, microwave sources, laser beam control, antennas, waveguides, modeling and simulation, and lethality mechanisms. This program provides the enabling technology necessary to demonstrate advanced concepts for high power microwave (HPM) sources, antennas and waveguides for mission areas not considered to date. The high power microwave lethality, hardware and software improvements and modeling and simulation advances provided by this program are essential to expand and build upon current architectures. Efforts in this program have been coordinated through the Department of Defense Science and Technology Executive Committee process to harmonize efforts and eliminate duplication.

This program is in Budget Activity 2, Applied Research, because this budget activity includes studies, investigations, and non-system specific technology efforts directed toward general military needs with a view toward developing and evaluating the feasibility and practicality of proposed solutions and determining their parameters.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 0602890D8Z I <i>High Energy Laser Development</i>
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B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	0.000	45.997	0.000	0.000	0.000
Current President's Budget	0.000	45.852	48.587	0.000	48.587
Total Adjustments	0.000	-0.145	48.587	0.000	48.587
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• FFRDC	-	-0.145	-	-	-
• Adjustments to Budget Year	-	-	46.911	-	46.911
• Economic Assumption	-	-	1.676	-	1.676

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602890D8Z / High Energy Laser Deve lopment				Project (Number/Name) 890 / High Energy Laser Development			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
890: High Energy Laser Development	0.000	0.000	45.852	48.587	0.000	48.587	49.663	50.673	51.711	52.745	Continuing	Continuing
Note												
In order to better align resources and program management to functional, organizational sponsorship, the High Energy Laser Research Initiatives program has transferred from the Air Force (PE 0602890D8Z) to the Office of the Secretary of Defense starting in FY 2022. This Program will focus on Applied Research for Directed Energy (DE) technologies divided into the following areas: (1) DE Sources; (2) Beam Control; (3) Lethality and Vulnerability; and (4) Power and Thermal Management to reflect the OSD S&T priorities for Directed Energy.												
A. Mission Description and Budget Item Justification												
This program funds Department of Defense Directed Energy applied research through the Joint Directed Energy Transition Office. This program is part of an overall Department of Defense Directed Energy Science and Technology program. DE weapons systems have many potential advantages, including speed-of-light time-to-target, high precision, low incremental cost per kill, and a magazine that is recharged through on-board, fuel-based power and thermal management systems that reduce logistics requirements in contrast to stocks of munitions or warheads. Directed Energy weapon systems have the potential to perform a wide variety of military missions, including high value asset and base protection, precision strike and platform self-protection versus a wide variety of missile, rocket, artillery, mortar and air platforms. Efforts under this program are generally chosen for their potential to have an impact on multiple Directed Energy weapon systems and multiple Service missions while complementing Service efforts that are directed for specific service needs. A broad range of technologies are addressed in key areas, such as laser sources, microwave sources, laser beam control, antennas, waveguides, modeling and simulation, and lethality mechanisms. This program provides the enabling technology necessary to demonstrate advanced concepts for high power microwave (HPM) sources, antennas and waveguides for mission areas not considered to date. The high power microwave lethality, hardware and software improvements and modeling and simulation advances provided by this program are essential to expand and build upon current architectures. Efforts in this program have been coordinated through the Department of Defense Science and Technology Executive Committee process to harmonize efforts and eliminate duplication.												
This program is in Budget Activity 2, Applied Research, because this budget activity includes studies, investigations, and non-system specific technology efforts directed toward general military needs with a view toward developing and evaluating the feasibility and practicality of proposed solutions and determining their parameters.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: Directed Energy Sources									-	12.028	14.176	
Description: Mature technologies that will provide system level performance commensurate with fieldable directed energy devices.												
FY 2022 Plans:												

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602890D8Z / <i>High Energy Laser Development</i>	Project (Number/Name) 890 / <i>High Energy Laser Development</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>- Develop high-reliability, lower-cost, efficient, and high-temperature diode pump sources. Scale alternate laser wavelengths to additional militarily relevant uses and power levels. Investigate next generation high power fiber technologies. Reduce technical risk in solid state lasers for inclusion in future laser weapon systems. Conduct trade space analyses to understand performance, fielding, robustness and integration issues for military platforms.</p> <p>- Investigate, analyze trade space, and reduce technical risk for high power microwave devices. Conduct analyses and trades studies to determine the most effective microwave source parameters.</p> <p>- Explore advanced concepts for technologies that will improve efficiency and decrease size and weight for future Directed Energy (DE) weapon sources. Evaluate materials for high energy laser and high power microwave weapons applications. Improve understanding of laser technologies to include material interaction and propagation. Scale electrically pumped lasers to higher kilowatt-class power levels.</p> <p>FY 2023 Plans:</p> <p>- Develop high-reliability, lower-cost, efficient diode pump sources. Scale alternate laser wavelengths to additional militarily relevant uses and power levels. Investigate next generation high power fiber technologies. Collaborate with the national and international directed energy community on progress in the development and application of high energy laser technologies for military missions. Reduce technical risk in solid state lasers for inclusion in future laser weapon systems. Conduct trade space analyses to understand performance, fielding, robustness and integration issues of the various architecture types for military platforms. Advance investments in illuminator laser sources and laser gain media and explore nontraditional fiber designs and materials for revolutionary increases in fiber performance, exploiting benefits of alternative wavelengths were possible.</p> <p>- Investigate, analyze trade space, and reduce technical risk for high power microwave devices. Conduct analyses and trades studies to determine the most effective microwave source parameters. Collaborate with the national and international directed energy community on progress in the development and application of high power microwave technologies for military missions.</p> <p>- Explore advanced concepts for technologies that will improve efficiency and decrease size and weight for future Directed Energy (DE) weapon sources. Evaluate materials for high energy laser and high power microwave weapons applications. Improve understanding of laser technologies to include material interaction and propagation. Scale electrically pumped lasers to higher kilowatt-class power levels.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Resourcing level increase due to year to year fluctuation.</p>			
Title: Beam Control and Propagation		-	27.464
			28.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602890D8Z / <i>High Energy Laser Development</i>	Project (Number/Name) 890 / <i>High Energy Laser Development</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>Description: Develop technologies that support improving beam control and beam propagation for DE weapon systems.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> - Develop beam control technologies for high energy laser weapon use across all domains of the Department. Develop technologies to improve the beam director throughput efficiency, optimize size and weight, and improve tracking and compensation through the atmosphere. - Characterize and understand the physics of high energy laser atmospheric propagation in adverse environmental conditions such as fog, rain, smoke and dust. Collaborate with the international directed energy community on progress in the development and application of high energy laser technologies for military missions. Validate predictive models through analysis of atmospheric propagation data and measurements. - Provide maintenance, verification, validation, and accreditation for updated system level atmospheric propagation and high energy laser system models. Collaborate with Service-sponsored field-test planning to correlate model predictions with measured data for surface, maritime and aerospace environments. Incorporate atmospheric data into theater models to support performance characterization tables. Continue the development of a predictive avoidance fire control system for use on multiple platforms. Develop kill assessment technologies. - Develop theoretical physical models describing the propagation of a high power microwave (HPM) pulse through the atmosphere to understand the reflection characteristics of the HPM propagation. Study and understand the dynamic behavior of the propagation of high-power microwave pulses and the effects on the intensity, frequency, and width of the pulse and the physical processes occurring during the interaction of the pulse with the air. Develop kill assessment technologies. Develop hardware and technologies to improve throughput efficiency of the antenna, decrease component weight, and improve tracking and compensation through the atmosphere. - Characterize and understand the physics of high power microwave propagation in adverse environmental conditions. Collaborate with the international directed energy community on progress in the development and application of high power directed energy weapon (DEW) technologies for military missions. <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Develop beam control technologies for high energy laser weapon use across all domains of the Department. Develop technologies to improve the beam director throughput efficiency, optimize size and weight, and improve/automate tracking and compensation through the atmosphere. Invest in atmospheric sensor innovation, field test evaluations, and next-generation models. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602890D8Z / <i>High Energy Laser Development</i>	Project (Number/Name) 890 / <i>High Energy Laser Development</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>- Characterize and understand the physics of high energy laser atmospheric propagation in adverse environmental conditions such as fog, rain, smoke and dust. Improve cameras and track illuminators to enable target engagement at longer ranges and enable improvements to shorten engagement timelines. Develop AI based tracking systems that show promise for automation of target recognition, aimpoint selection and maintenance as well as tracking in clutter. Explore Digital Holography to enable wavefront compensation with improved deformable mirrors for HEL propagation through severe turbulence and reducing SWaP</p> <p>- Collaborate with the national and international directed energy community on progress in the development and application of high energy laser technologies for military missions. Validate predictive models through analysis of atmospheric propagation data and measurements.</p> <p>- Provide maintenance, verification, validation, and accreditation for updated system level atmospheric propagation and high energy laser system models. Collaborate with Service-sponsored field-test planning to correlate model predictions with measured data for surface, maritime and aerospace environments. Incorporate atmospheric data into theater models to support performance characterization tables. Continue the development of a predictive avoidance fire control system for use on multiple platforms.</p> <p>- Develop theoretical physical models describing the propagation of a high power microwave (HPM) pulse through the atmosphere to understand the reflection characteristics of the HPM propagation. Study and understand the dynamic behavior of the propagation of high-power microwave pulses and the effects on the intensity, frequency, and width of the pulse and the physical processes occurring during the interaction of the pulse with the air. Develop hardware and technologies to improve throughput efficiency of the antenna, decrease component weight, and improve tracking and compensation through the atmosphere.</p> <p>- Characterize and understand the physics of high power microwave propagation in adverse environmental conditions. Collaborate with the national and international directed energy community on progress in the development and application of high power directed energy weapon (DEW) technologies for military missions.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.</p>			
<p>Title: Lethality and Vulnerability</p> <p>Description: Conduct directed energy vulnerability experiments on materials, components, and targets. Develop a lethality database, and integrate into a systems-level architecture plan and lethality models.</p> <p>FY 2022 Plans:</p>		-	6.411

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602890D8Z / <i>High Energy Laser Development</i>	Project (Number/Name) 890 / <i>High Energy Laser Development</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>- Integrate lethality and target imagery data into campaign-level high energy laser system models. Conduct high energy laser vulnerability experiments on materials, components, and targets. Develop a suite of high energy laser weapon tools to be used in a database from which the warfighter can assess target vulnerabilities and mission utility for a given high energy laser weapon platform and engagement. Develop warfighter tools employing Service and Agencies metrics and criteria such as the Joint Munitions Effectiveness Standards.</p> <p>- Develop new predictive modeling software tools to assess the effectiveness of high power microwave (HPM) weapons on electronic systems of interest for blue-on-red or red-on-blue engagements. Evaluate statistical and deterministic cavity coupling algorithms to estimate the temporal and spectral characteristics of the HPM energy coupled into complicated enclosures. Leverage advancements in predictive circuit effects, garnered through several Service and Agency-funded programs, to model and predict the response of complicated electronics to the incident HPM stimulus. Develop warfighter tools employing Service and Agencies metrics and criteria such as the Joint Munitions Effectiveness Standards.</p> <p>- Collaborate with Service and Agency sponsored High Power microwave survivability / lethality community's interest in, and use of, high power microwave (HPM) engagement models. Continue to provide maintenance, verification, validation, and accreditation for updated system level standalone model that can be used to estimate the probability of electronic upset or damage as a function of the HPM power density on the target and associated range. Develop warfighter tools to determine the power density required on a target to produce a functional kill and understand the required parameters of the HPM, such as power, frequency/ wavelength, modulation, and engagement angle for the kill.</p> <p>FY 2023 Plans:</p> <p>- Integrate lethality and target imagery data into campaign-level high energy laser system models. Conduct high energy laser vulnerability experiments on materials, components, and targets. Conduct laser lethality effects testing and modeling specifically focused on subsonic / supersonic threats, assessment of threat aim-points, development of sophisticated techniques to rapidly determine threat vulnerability and techniques to accurately predict time-to-kill. Evaluate the utility of CW vs Pulsed laser effects in c-CM and c-Hypersonic missile defense. Develop a suite of high energy laser weapon tools to be used in a database from which the warfighter can assess target vulnerabilities and mission utility for given high energy laser weapon platform and engagement. Develop warfighter tools employing Service and Agencies metrics and criteria such as the Joint Munitions Effectiveness Standards.</p> <p>- Develop new predictive modeling software tools to assess the effectiveness of high power microwave (HPM) weapons on electronic systems of interest for blue-on-red or red-on-blue engagements. Evaluate statistical and deterministic cavity coupling algorithms to estimate the temporal and spectral characteristics of the HPM energy coupled into complicated enclosures. Leverage advancements in predictive circuit effects, garnered through several Service and Agency-funded programs, to model</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602890D8Z / <i>High Energy Laser Development</i>	Project (Number/Name) 890 / <i>High Energy Laser Development</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>and predict the response of complicated electronics to the incident HPM stimulus. Develop warfighter tools employing Service and Agencies metrics and criteria such as the Joint Munitions Effectiveness Standards.</p> <p>- Collaborate with Service and Agency sponsored High Power microwave survivability / lethality community's interest in, and use of, high power microwave (HPM) engagement models. Continue to provide maintenance, verification, validation, and accreditation for updated system level standalone model that can be used to estimate the probability of electronic upset or damage as a function of the HPM power density on the target and associated range. Develop warfighter tools to determine the power density required on a target to produce a functional kill and understand the required parameters of the HPM, such as power, frequency/ wavelength, modulation, and engagement angle for the kill.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> There is no significant change between FY 2022 and FY 2023.</p>			
Accomplishments/Planned Programs Subtotals		-	45.852
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
N/A			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	PE 0603000D8Z <i>I Joint Munitions Advanced Technology</i>											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	21.625	30.140	34.065	0.000	34.065	38.823	36.359	31.873	25.370	Continuing	Continuing
077: <i>Enhanced Munitions Advanced Technology</i>	-	15.373	30.140	34.065	0.000	34.065	38.823	36.359	31.873	25.370	Continuing	Continuing
301: <i>Enabling Fuze Advanced Technology</i>	-	6.252	-	-	-	-	-	-	-	-	Continuing	Continuing

Note

New Start (Y/N): Partial (High Reliability Cluster Munition \$11M)

This Program Element (PE) aligns with PE 0602000D8Z, Joint Munitions Advanced Technology. The two project codes within each PE form the 6.2 applied research and 6.3 technology demonstration components of the Joint Enhanced Munitions Technology Program (JEMTP) and the Joint Fuze Technology Program (JFTP). The JEMTP funds applied research efforts from PE 0602000D8Z Project code (P) 076 Enhanced Munitions and technology demonstration efforts from PE 0603000D8Z P077.

The JFTP funds applied research efforts from PE 0602000D8Z P204 Enabling Fuze Technology and technology demonstration efforts from PE 0603000D8Z P301. In FY 2022 the JFTP and JEMTP merged and the program scope expanded to exploit technology developments and accelerate their application to enable next generation kinetic weapons capabilities in the areas of energetic materials, propulsion, warhead effects, fuzing, power sources, guidance, navigation & control, communications and munitions airframe applied technologies.

With the JFTP and JEMTP merge in FY 2022, the P301: Enabling Fuze Advanced Technology line and budget have combined into P077: Enhanced Munitions Advanced Technology.

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression, and Defend the Homeland.

This program advances, demonstrates and transitions joint, pervasive munitions enhancing technologies (warheads, propulsion systems, advanced lethality mechanisms, fuzes and fuze components, and targeting). The goal is to demonstrate joint enabling technologies that increase and improve the performance, lethality, range, reliability, safety, and survivability for existing and inform development of future weapons systems. The program strategically develops and demonstrates advanced munitions technologies that ensure warfighter technical superiority and enable outcomes in the Joint fight. The program technology objectives include: high-speed weapon delivery, longer-range precision effects, networked and collaborative systems of systems, agility at the engagement level, increased capacity/affordable munitions, survivability during deployment and target engagement, and open systems architecture. This program's Joint Munitions Advanced Technologies are vital to guide, coordinate and maximize DoD and Service S&T munitions investments into follow-on system demonstration and integration activities.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603000D8Z <i>I Joint Munitions Advanced Technology</i>
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The program prioritizes investments from a Joint Service perspective and demonstrates technologies that inform capabilities, thus maximizing efficiencies and ensuring the development of technologies with the broadest applicability to ensure good stewardship of taxpayer dollars. This munitions Science and Technology (S&T) program focuses on enhancements in weapon speed, range, and lethality while largely utilizing existing advanced insensitive munitions (IM) technology to maximize weapon safety.

In order to maintain superiority against near peer adversaries, there is an urgent need to provide U.S. warfighters with augmented or new capabilities to ensure technical superiority. The program follows a threat/opportunity analysis to develop kinetic capabilities that enable scenario-based effects from a Joint Fight perspective by exploring technological advances that are beyond Service investment risk acceptance and target asymmetric advantage. The goal is to enable military dominance to ensure effective deterrence of adversary aggression.

The program follows a threat/opportunity analysis to develop kinetic capabilities that enable scenario-based effects from a Joint Fight perspective by exploring technological advances that are beyond Service investment risk acceptance and target asymmetric advantage. The goal is to enable military dominance to ensure effective deterrence of adversary aggression.

B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	22.905	23.213	0.000	0.000	0.000
Current President's Budget	21.625	30.140	34.065	0.000	34.065
Total Adjustments	-1.280	6.927	34.065	0.000	34.065
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	7.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.917	-			
• SBIR/STTR Transfer	-0.359	-			
• Other Reprogramming	-0.004	-	-	-	-
• FFRDC	-	-0.073	-	-	-
• Adjustments to Budget Year	-	-	22.269	-	22.269
• Economic Assumption	-	-	0.796	-	0.796
• High Reliability Cluster Munition	-	-	11.000	-	11.000

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 077: *Enhanced Munitions Advanced Technology*

Congressional Add: *Energetics Revitalization*

<u>FY 2021</u>	<u>FY 2022</u>
-	7.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603000D8Z <i>I Joint Munitions Advanced Technology</i>	
Congressional Add Details (\$ in Millions, and Includes General Reductions)		FY 2021	FY 2022
Congressional Add Subtotals for Project: 077		-	7.000
Congressional Add Totals for all Projects		-	7.000
<u>Change Summary Explanation</u> FY 2022 funding increase reflects Congressional add of \$7.000 million for Energetics Revitalization. FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603000D8Z / Joint Munitions Advanced Technology				Project (Number/Name) 077 / Enhanced Munitions Advanced Technology			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
077: Enhanced Munitions Advanced Technology	-	15.373	30.140	34.065	0.000	34.065	38.823	36.359	31.873	25.370	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Enhanced Munitions Advanced Technology effort will demonstrate enabling technologies and perform associated applied research that will improve the performance, range, and lethality of existing and future weapons systems. This effort will take promising technologies demonstrated at the laboratory scale and transition them into demonstration programs utilizing generic hardware based munitions in the concept and development stages. Mature demonstrated Enhanced Munitions technology can be transitioned, thereby decreasing the Program Executive Office's (PEO) program costs and schedule risk, facilitating spin-offs to other munitions within their portfolios. Technologies demonstrated seek to improve the performance, lethality, and range of weapons to ensure the U.S. is not outgunned and outranged on the battlefield of the future.

Through FY 2021, the Joint Enhanced Munitions Technology Program (JEMTP) investments focus on five Munition Areas: 1) High Performance Propulsion - Alternative propulsion designs and systems for increased range, e.g. rotating detonation engines, solid fuel ramjets, highly loaded grain technology, etc.; 2) Minimum Signature Propulsion – new propellant compositions and hybrid propulsion for reduced time to target/increased range; 3) Area Effects Warheads – high performance explosives, reactive materials, multiphase blast, etc.; 4) Hard Target Effects Warheads – improved penetration for shaped charge jets, lethality enhancements for area effects munitions; and 5) Gun Propulsion – novel ignition schemes, advanced propellant design, etc. Munition Area Technology Groups (MATG), under tri- service leadership, have developed technology roadmaps for each Munition Area which are used to guide investments.

In FY 2022, the JFTP and JEMTP merged and the program scope expanded to exploit technology developments such as hypersonics, machine learning, artificial intelligence, quantum computing, etc. and accelerate their application to enable next generation kinetic weapons capabilities in the areas of energetic materials, advanced propulsion, warhead effects, enabling fuze technologies, and pioneering targeting technologies with a specific focus on enhancing kinetic weapons lethality, range and resultant effects. The program will retain tri-service leadership to inform technology investments accelerating development across the Department. Investments will be informed by a threat-opportunity based analysis that focuses on developing weapons systems that exploit technology dominance to ensure military objectives in Joint Force campaign scenarios. New technology roadmaps for munition technical areas will guide investments consistent with the DoD National Defense Strategy and inform Service technology investments.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Enhanced Munitions Advanced Technology	15.373	23.140	23.065
Description: Enhanced Munitions Advanced Technology focuses on the following key areas: - Munitions Versatility: Combined and Collaborative Kinetic Effects - Munitions Readiness: Modularity, Advanced Manufacturing and Materials			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603000D8Z / <i>Joint Munitions Advanced Technology</i>		Project (Number/Name) 077 / <i>Enhanced Munitions Advanced Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> - Munitions Efficiency: Weapon Survivability - Munitions Effectiveness: <ul style="list-style-type: none"> • Munitions Kinetic and Tailorable Lethality Effects • Propulsion Systems • Target Detection and Burst Point Control <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> - Complete advanced performance testing on half scale improved missile boost motor demonstrator. Conduct motor preparations and static motor firing for air defense system. - Complete testing and down-selection on preliminary designs for missile motor and case assemblies to support an extended range air to ground missile system, and begin final motor manufacturing. Conduct ground and prepare for flight testing of improved ground to ground flight motor. - Complete final design and static testing of an enhanced range small diameter rocket motor system. - Complete inlet and nozzle design for a modular propulsion system for air to ground system with improved range and speed. - Conduct final design testing in multi-warhead configuration using novel high explosive material loaded hardware for improved performance. - Scale up a novel improved propellant formulation and conduct performance testing. Scale-up extended range propellant for indirect fire weapon system and conduct initial full-scale weapon tests. - Demonstrate high energy density, thin film battery with thin film heat source for broad applications including artillery, missiles, and miniature munitions. - Develop and demonstrate robust and survivable target sensor solution for high-speed weapons. - Develop high-speed weapon survivable and quick triggering high voltage Electronics Safe and Arm Devices (ESADs) components. - Develop advanced sub-scale testing method and apparatus to rapidly evaluate survivability of fuzing components in high shock, extreme environments. - Develop new multi-mode ultrafast targeting algorithms exploiting advancements in microelectronics and materials. - Begin advanced collaborative and cooperative munitions design concepts using technologies facilitating communication and networking impacting guidance, target detection, and weapons effectiveness. <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Complete advanced technology design of Solid Fuel Ramjet missile motor and case assemblies to support an extended range air to ground missile system, and fabricate for a maximum range test. - Complete design and fabrication of hardware and scale up selected propellant for a full-size test of an improved missile boost motor demonstrator for extended range in cruise missiles. 					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603000D8Z I Joint Munitions Advanced Technology	Project (Number/Name) 077 I Enhanced Munitions Advanced Technology		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<div>- Complete fabrication and deployment of inlet design and down-selection testing of nozzle design for a modular propulsion system for air to ground system with improved range and speed.</div> <div>- Initiate high resolution height of burst radar work leveraging Multiple Input Multiple Output (MIMO) technology currently used in communication and automotive industries by upscaling to handle closing velocities up to Mach 5.</div> <div>- Continue future miniature precision munitions work by completing space claims for fuzing, seeker/sensor, guidance and warhead and initiating integration efforts.</div> <div>- Complete the characterization of Exploding Foil Initiator designs incorporating a Direct Header Deposition (DHD) design to demonstrate superior extreme environment survivability over the current state of the art.</div> <div>- Develop and demonstrate feasibility of cooperative munitions technology incorporating communication and networking impacting guidance, target detection to enhance multiple weapons effectiveness.</div> <div>FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.</div>					
<div>Title: High Reliability Cluster Munition</div> <div>Description: Execute enhanced area effects munitions technology development with transition into weapon demonstrators.</div> <div>FY 2023 Plans:<div>- Conduct system level weapon area effects analyses.</div><div>- Develop robust and efficient communications and power distribution between the munition's main fuze and individual submunitions.</div><div>- Model and design optimized distributed munition expulsion, dispersion, and stabilization.</div><div>- Develop precision submunition target detection and optimized warhead output.</div><div>- Execute plans and projects through Joint Service and Industry team. Identify and coordinate Service demonstration and transition paths for High Reliability Cluster Munition.</div></div> <div>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 increase for High Reliability Cluster Munition effort established to develop technology in response to area effects capability gap/opportunity identified through Army and Air Force campaign scenario analysis.</div>			-	-	11.000
Accomplishments/Planned Programs Subtotals			15.373	23.140	34.065
			FY 2021	FY 2022	
Congressional Add: Energetics Revitalization			-	7.000	

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603000D8Z / <i>Joint Munitions Advanced Technology</i>	Project (Number/Name) 077 / <i>Enhanced Munitions Advanced Technology</i>
	FY 2021	FY 2022
<i>FY 2022 Plans:</i> Program increase will be used to accelerate modernization of energetic materials research, development and manufacturing. Energetic materials are Defense unique ingredients critical to all kinetic weapons systems. This effort will develop and demonstrate new energetics manufacturing capabilities focused on enhancing production efficiency, speed, and reducing single source risk to meet future warfighter and national security needs.		
Congressional Adds Subtotals	-	7.000

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603000D8Z / Joint Munitions Advanced Technology				Project (Number/Name) 301 / Enabling Fuze Advanced Technology			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
301: Enabling Fuze Advanced Technology	-	6.252	-	-	-	-	-	-	-	-	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program will develop and demonstrate advanced fuze technologies needed to develop weapons that address Joint priority capability areas highlighted by the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) Technology-Focused Modernization and Service Science and Technology (S&T) priorities including High Speed Weapons, Collaborative/Networked Munitions, Counter Unmanned Aerial System (c-UAS) Air Defense and Scalable Lethality. This effort will take promising integrated technologies to maturity and demonstrate capability utilizing weapon hardware derived from priority munitions capabilities and technologies. Demonstrated mature fuze technology will be transitioned, thereby decreasing acquisition program costs and schedule risk and facilitating spin-offs to other munitions within their portfolios. Under the Joint Fuze Technology Program (JFTP), investments are focused on specific capability areas that have been identified by Department strategic guidance and are focused on capability areas that are driven by next generation high speed and advanced weapons. The four capability areas are: 1) Extreme Environment Survivable Fuzing, 2) Tailorable Effects Fuzing and Warhead Initiation, 3) High Reliability Safe and Arm Technology, and 4) Target Detection and Burst Point Control.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Enabling Fuze Advanced Technology	6.252	-	-
Description: Enabling Fuze Advanced Technology focuses on the following key areas:			
- Extreme Environment Survivable Fuzing - develops fuze components to increase the effectiveness of high-speed munitions by improving the prediction tools and testing methodologies to evaluate the survivability and functionality of future fuzes.			
- Tailorable Effects Fuzing and Warhead Initiation - develops fuzing for tailorable effects weapons that encompasses the ability to selectively vary the output of the weapon (Dial-a-Yield) and/or the ability to generate selectable effects (e.g., directed blast, fragmentation).			
- High Reliability Safe and Arm Technology - develops high reliability fuzing architectures, fuzing components, and Unexploded Ordnance (UXO) reduction features enabling the next generation of cluster munitions to achieve the required <1% UXO goal while Increasing the reliability across the board for future weapon systems.			
- Target Detection and Burst Point Control develops sensing and algorithm solutions to demonstrate smaller, more capable target detection while meeting or exceeding the performance of existing technologies in order to operate in extreme and challenging weapon environments.			
Accomplishments/Planned Programs Subtotals	6.252	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603000D8Z / Joint Munitions Advanced Technology	Project (Number/Name) 301 / Enabling Fuze Advanced Technology
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy N/A		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603121D8Z / <i>SO/LIC Advanced Development</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	4.847	4.904	4.665	4.919	-	4.919	5.072	5.180	5.200	5.304	-	-
121: <i>SO/LIC Advanced Development</i>	4.847	4.904	4.665	4.919	-	4.919	5.072	5.180	5.200	5.304	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression, Defend the Homeland, and Build Sustainable and Long-Term Advantage.

The SUNet enterprise system is an unclassified, secure information platform that allows the user to communicate, analyze, and share information between defense, interagency, and foreign partners. Rested on SUNet are mission specific enclaves used to detect, monitor, understand, and act in the information environment. The SUNet system provides defense and interagency partners with an accredited platform that enables secure unclassified information sharing, joint analysis, and advanced RDT&E in support of critical operational missions on a global scale. The platform currently supports more than a dozen sponsoring agencies with a range of missions, including but not limited to research and analysis of publicly available information, Phase 0 shaping, informing and influencing; building partner capacity; and enables rapid, iterative development and fielding of artificial intelligence and machine learning. The SUNet platform enables IWTSD to identify and develop capabilities to combat terrorism and irregular adversaries, and deliver these capabilities to DoD components and interagency partners with a provision of support to US military operations.

B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	4.904	4.665	0.000	-	0.000
Current President's Budget	4.904	4.665	4.919	-	4.919
Total Adjustments	0.000	0.000	4.919	-	4.919
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustment to Budget Year	-	-	4.919	-	4.919

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)		R-1 Program Element (Number/Name) PE 0603121D8Z / SO/LIC Advanced Development		
Change Summary Explanation FY 2023 funding increase reflects the fact that the FY 2022 President’s Budget request did not include out-year funding.				
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Title: Secure, Unclassified Network (SUNet) Description: The SUNet enterprise system is an unclassified, secure information platform that allows the user to communicate, analyze, and share information between defense, interagency, and foreign partners. Rested on SUNet are mission specific enclaves used to detect, monitor, understand, and act in the information environment. The SUNet system provides defense and interagency partners with an accredited platform that enables secure unclassified information sharing, joint analysis, and advanced RDT&E in support of critical operational missions on a global scale. The platform currently supports more than a dozen sponsoring agencies with a range of missions, including but not limited to research and analysis of publicly available information, Phase 0 shaping, informing and influencing; building partner capacity; and enables rapid, iterative development and fielding of artificial intelligence and machine learning. The SUNet platform enables IWTSD to identify and develop capabilities to combat terrorism and irregular adversaries, and deliver these capabilities to DoD components and interagency partners with a provision of support to US military operations. FY 2022 Plans: Expand the Competitive Space. Continue an effort to develop, integrate, test, deploy, manage and maintain a SUNet enterprise system with an emphasis on enhanced network engineering, information assurance, cybersecurity monitoring, enterprise governance, policy support, system redundancy and failover to efficiently and effectively support a growing number of users and missions across the platform. FY 2023 Plans: Expand the Competitive Space. Continue an effort to develop, integrate, test, deploy, manage and maintain a SUNet enterprise system with an emphasis on enhanced network engineering, information assurance, cybersecurity monitoring, enterprise governance, policy support, system redundancy and failover to efficiently and effectively support a growing number of users and missions across the platform. FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.		4.904	4.665	4.919
Accomplishments/Planned Programs Subtotals		4.904	4.665	4.919
D. Other Program Funding Summary (\$ in Millions) N/A				
Remarks				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603121D8Z / <i>SO/LIC Advanced Development</i>	
E. Acquisition Strategy N/A		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)</i>					R-1 Program Element (Number/Name) PE 0603122D8Z / <i>Combating Terrorism Technology Support</i>							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	1,070.605	140.882	141.876	72.614	-	72.614	75.169	76.727	78.263	79.829	-	-
484: <i>Combating Terrorism Technology Support (CTTS)</i>	1,070.605	121.594	141.876	72.614	-	72.614	75.169	76.727	78.263	79.829	-	-
485: <i>Combating Terrorism Technology Support (CTTS) - OCO</i>	0.000	19.288	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression, Defend the Homeland, and Build Sustainable and Long-Term Advantage.

The Irregular Warfare Technical Support Directorate (IWTSD), via the combating terrorism support program, supports the National Defense Strategy (NDS), the Irregular Warfare Annex, and will provide peer and near-peer threat areas increased priority. This program recognizes that many of the existing requirements already support many of the high interest areas, to include increasing lethal capability of U.S. forces at the squad and small unit level; countering Small Unmanned Aerial Systems (drones) overseas and domestically; tunnel detection and mapping in theater; novel body and vehicle armor; detecting, protecting against, and mitigating novel and wartime CBRNE threats; telematics; covert communications; and of special interest, the use of machine learning and artificial intelligence to enhance the capability of systems used by the military and lessen the workload on the individual users.

During FY 2023, IWTSD will continue to focus its R&D activities rapidly to fill the immediate, emerging and critical capability gaps of special operations forces, other military operators, intelligence analysts, and first responders that are at the leading edge of the fight or response.

In FY 2022 or until funds are expended, the IWTSD will continue to address countering small unmanned aerial vehicles and enhance detection of, and operations in, tunnels through implementation of the FY 2021 Congressionally directed and funded cooperative 50-50 cost sharing RDT&E projects with Israel.

Although COVID 19 has greatly impacted the nation, IWTSD was able to collaborate and coordinate with users and industry using the virtual environment. While not optimum, this capability allowed the IWTSD to continue to meet and fill our user's capability gaps and help keep small businesses operating. The IWTSD is rapidly returning to in-person work and travel, but due to COVID-19, had to extend some contracts for vendors due to the negative impacts in the supply chain, lack of personnel, and the availability of laboratories for testing.

From a broader perspective, projects remain distributed among 10 mission categories, in line with the interagency Technical Support Working Group (TSWG):

- Advanced Analytics

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603122D8Z / <i>Combating Terrorism Technology Support</i>
<ul style="list-style-type: none"> • Chemical, Biological, Radiological, Nuclear, and Explosives • Explosive Ordnance Disposal and Explosive Operations • Expeditionary Force Protection • Forensic Exploitation and Identity Operations • Human Performance and Training • Indirect Influence and Competition • Protection, Survivability, and Recovery • Surveillance, Collection, and Operations Support • Tactical Offensive Support <p>Each of these programs have long held strong R&D partnerships with the components of USSOCOM, the Services; and many Defense Agencies.</p> <p>While supporting the NDS by filling capability gaps for great power competition, the IWTSD program will also continue to identify capabilities to combat terrorism and irregular adversaries and quickly deliver these capabilities to U.S. Defense and interagency users, as well as international partners through rapid research and development, advanced studies, and technical innovation. The IWTSD continues to expand its partnerships with other Defense and the Interagency components, as well as with our foreign partners' rapid development and acquisition organizations to leverage their expertise and reduce unnecessary duplication as it tries to expedite and transition new and innovative capabilities. IWTSD is unique in its approach, annually obtaining joint requirements directly from military operators, intelligence analyst, and first responders and discussing those requirements with industry even before the requirements are released in a Broad Agency Announcement (BAA).</p> <p>The IWTSD program continues to be a diverse, advanced technology development effort that capitalizes on interagency and international participation to demonstrate the utility and effectiveness of technology when applied to combating peer or near-peer forces, emerging threats, and combating terrorism requirements. This includes rapid technology development, safety testing, proof-of-concept demonstrations, operational test and evaluations of prototypes in the field, and coordinating the transition from development to production and operational use.</p> <p>Beginning with the FY 2021 plan, the time from requirements to contracts was shortened to ensure the IWTSD was addressing the most near-term, identified needs. As such, the FY 2023 Program Requirements Meetings with users occurred in January, 2022 and contract awards will begin in October or November 2022 (the start of FY 2023). The IWTSD normally manages approximately 220 individual projects and international task plans; while also reviewing proposals and negotiating contracts for another 70 requirements for the next fiscal year.</p> <p>The IWTSD program justified in the R-2 exhibit identifies the projects fully or partially funded by Congressional appropriations for the IWTSD program. However, IWTSD also develops technology and provides support using external funds provided by other DoD and federal departments and international partnerships. The funds for these projects and support activities are not reflected in this justification R-2; but the number of activities does reflect positively on the trust and competence that IWTSD has earned throughout the Department of Defense and interagency to rapidly conduct critical RDT&E and provide innovative products.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense Date: April 2022

Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)	R-1 Program Element (Number/Name) PE 0603122D8Z / Combating Terrorism Technology Support
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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	144.847	69.376	0.000	-	0.000
Current President's Budget	140.882	141.876	72.614	-	72.614
Total Adjustments	-3.965	72.500	72.614	-	72.614
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	72.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.965	-			
• Adjustment to Budget Year	-	-	72.614	-	72.614

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603122D8Z / Combating Terrorism Technology Support				Project (Number/Name) 484 / Combating Terrorism Technology Support (CTTS)			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
484: Combating Terrorism Technology Support (CTTS)	1,070.605	121.594	141.876	72.614	-	72.614	75.169	76.727	78.263	79.829	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

The Irregular Warfare Technical Support Directorate (IWTSD), via the combating terrorism support program, supports the National Defense Strategy (NDS), the Irregular Warfare Annex, and will provide peer and near-peer threat areas increased priority. This program recognizes that many of the existing requirements already support many of the high interest areas, to include increasing lethal capability of U.S. forces at the squad and small unit level; countering Small Unmanned Aerial Systems (drones) overseas and domestically; tunnel detection and mapping in theater; novel body and vehicle armor; detecting, protecting against, and mitigating novel and wartime CBRNE threats; telematics; covert communications; and of special interest, the use of machine learning and artificial intelligence to enhance the capability of systems used by the military and lessen the workload on the individual users.

During FY 2023, IWTSD will continue to focus its R&D activities rapidly to fill the immediate, emerging and critical capability gaps of special operations forces, other military operators, intelligence analysts, and first responders that are at the leading edge of the fight or response.

In FY 2022 or until funds are expended, the IWTSD will continue to address countering small unmanned aerial vehicles and enhance detection of, and operations in, tunnels through implementation of the FY 2021 Congressionally directed and funded cooperative 50-50 cost sharing RDT&E projects with Israel.

Although COVID 19 has greatly impacted the nation, IWTSD was able to collaborate and coordinate with users and industry using the virtual environment. While not optimum, this capability allowed the IWTSD to continue to meet and fill our user's capability gaps and help keep small businesses operating. The IWTSD is rapidly returning to in-person work and travel, but due to COVID-19, had to extend some contracts for vendors due to the negative impacts in the supply chain, lack of personnel, and the availability of laboratories for testing.

From a broader perspective, projects remain distributed among 10 mission categories, in line with the interagency Technical Support Working Group (TSWG):

- Advanced Analytics
- Chemical, Biological, Radiological, Nuclear, and Explosives
- Explosive Ordnance Disposal and Explosive Operations
- Expeditionary Force Protection
- Forensic Exploitation and Identity Operations
- Human Performance and Training

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603122D8Z / Combating Terrorism Technology Support	Project (Number/Name) 484 / Combating Terrorism Technology Support (CTTS)
<ul style="list-style-type: none">• Indirect Influence and Competition• Protection, Survivability, and Recovery• Surveillance, Collection, and Operations Support• Tactical Offensive Support		
Each of these programs have long held strong R&D partnerships with the components of USSOCOM, the Services; and many Defense Agencies.		
While supporting the NDS by filling capability gaps for great power competition, the IWTSD program will also continue to identify capabilities to combat terrorism and irregular adversaries and quickly deliver these capabilities to U.S. Defense and interagency users, as well as international partners through rapid research and development, advanced studies, and technical innovation. The IWTSD continues to expand its partnerships with other Defense and the Interagency components, as well as with our foreign partners’ rapid development and acquisition organizations to leverage their expertise and reduce unnecessary duplication as it tries to expedite and transition new and innovative capabilities. IWTSD is unique in its approach, annually obtaining joint requirements directly from military operators, intelligence analyst, and first responders and discussing those requirements with industry even before the requirements are released in a Broad Agency Announcement (BAA).		
The IWTSD program continues to be a diverse, advanced technology development effort that capitalizes on interagency and international participation to demonstrate the utility and effectiveness of technology when applied to combating peer or near-peer forces, emerging threats, and combating terrorism requirements. This includes rapid technology development, safety testing, proof-of-concept demonstrations, operational test and evaluations of prototypes in the field, and coordinating the transition from development to production and operational use.		
Beginning with the FY 2021 plan, the time from requirements to contracts was shortened to ensure the IWTSD was addressing the most near-term, identified needs. As such, the FY 2023 Program Requirements Meetings with users occurred in January, 2022 and contract awards will begin in October or November 2022 (the start of FY 2023). The IWTSD normally manages approximately 220 individual projects and international task plans; while also reviewing proposals and negotiating contracts for another 70 requirements for the next fiscal year.		
The IWTSD program justified in the R-2 exhibit identifies the projects fully or partially funded by Congressional appropriations for the IWTSD program. However, IWTSD also develops technology and provides support using external funds provided by other DoD and federal departments and international partnerships. The funds for these projects and support activities are not reflected in this justification R-2; but the number of activities does reflect positively on the trust and competence that IWTSD has earned throughout the Department of Defense and interagency to rapidly conduct critical RDT&E and provide innovative products.		
B. Accomplishments/Planned Programs (\$ in Millions)		
Title: Advanced Analytic Capabilities (AAC)		
Description: The Advanced Analytics (AA) Subgroup's objective is to develop and deploy integrated analytic capabilities; enabling Commanders, Warfighters, and Mission Partners to share information and make better/faster decisions at the Strategic, Operational, and Tactical levels. AA projects improve sense- making, decision-making, and data management across a range of mission areas.		
	FY 2021	FY 2022
	4.969	5.046
		FY 2023
		6.308

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B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>FY 2022 Plans:</p> <p>In FY 2022, the AA Subgroup plans to initiate funding 3 projects in areas focused on 1) irregular warfare as a core competency and 2) enhancing survivability for personnel and facilities. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • A ML-based capability to camouflage RF communications with local partner forces within typical local RF traffic. • An AI enterprise platform for information environment analysis that harnesses multiple large datasets to expose relevant trends and connections, and forecasts future OIE impacts for given COAs. • A TAK (Tactical Assault Kit)-plugin software that supports manual and automated data entry in the field for weather forecasting to guide the operator's workflow during pre-mission planning and preparation, mission execution, and post-mission assessments, and to identify all initial and recurring data requirements to generate reports on the operational environment of interest to combat leaders. <p>In FY 2022, the AA Subgroup also plans to complete 7 projects in areas focused on 1) irregular warfare as a core competency, 2) sustained combating terrorism, and 3) expanding the completeive space. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • An open source information prototype that uses current anticipatory analytic approaches to enable forecasting over three to five years to better forecast and project geopolitical turmoil that will drive future Title 10 requirements. • New capabilities for investigating and tracing the source of crypto-currency transactions using both commercial tools and intelligence sources. • Algorithms and machine learning methodologies that leverage all available data from multiple sensor platform for tunnel detection. • Software capable of using open source and other available information to develop a detailed country model comprising iterative models for national, provincial, and local organizational elements across political, economic, military, socioeconomic and cultural domains. <p>FY 2023 Plans:</p> <p>For FY 2023, the AA Subgroup is currently evaluating proposals, and plans to initiate funding 5 new requirements. Also, in FY 2023, the AA Subgroup plans to continue or complete funding 3 projects in areas focused on 1) irregular warfare as a core competency and 2) enhancing survivability for personnel and facilities. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • A ML-based capability to camouflage RF communications with local partner forces within typical local RF traffic. • An AI enterprise platform for information environment analysis that harnesses multiple large datasets to expose relevant trends and connections, and forecasts future OIE impacts for given COAs. • A TAK (Tactical Assault Kit)-plugin software that supports manual and automated data entry in the field for weather forecasting to guide the operator's workflow during pre-mission planning and preparation, mission execution, and post-mission assessments, 					

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B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
and to identify all initial and recurring data requirements to generate reports on the operational environment of interest to combat leaders.					
FY 2022 to FY 2023 Increase/Decrease Statement: Increase reflective of Departmental priorities in artificial intelligence, big data analytics, and decision-making at the strategic and tactical levels.					
Title: CHEMICAL, BIOLOGICAL, RADIOLOGICAL, NUCLEAR, AND EXPLOSIVES (CBRNE) Description: The CBRNE Subgroup's objective is to improve defense capabilities to meet tomorrow's CBRNE threats. The subgroup focuses on threat characterization; materials attribution; personal protective equipment; detection of CBRNE materials at trace and bulk levels at point, proximity and stand-off distances; development of information resources and decision support tools to assist response elements with risk-based decision making; and consequence management for post-event activities. FY 2022 Plans: In FY 2022, the CBRNE Subgroup plans to initiate funding 10 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, 2) Sustain CBRNE Units for Defense and the Homeland, and 3) Strengthen Alliances. Examples include, but are not limited to: <ul style="list-style-type: none"> • Development of a portable, ruggedized Raman microscopy system capable of detecting trace explosives and other residues with minimal logistical burden for operators. • Assessment and further development of the Functional Genomic and Computational Assessment of Threats (Fun GCAT) system to identify attempts to exploit natural and synthetic biology for nefarious purposes. • Development of a respirator that combines a supplied air respirator and powered air purifying respirators (PAPR) in a form factor that can function in subterranean environments for at least six hours. In FY 2022, the CBRNE Subgroup plans to continue 16 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, 2) Sustain CBRNE Units for Defense and the Homeland. 3) Integrate with the U.S. Interagency, 4) Strengthen Alliances, and 5) Enable U.S. Interagency Counterparts to Advance U.S. Influence and National Security Interests. Examples include, but are not limited to: <ul style="list-style-type: none"> • Development of a man-portable system that can reliably detect explosives through continuous gas phase monitoring. • Determination of operationally deployed detection techniques and systems could be further developed or exploited to provide additional chemical detection capabilities in a search environment. • Development of an advanced analytical database of improvised CB agent and homemade explosive production methods. • Development of a respiratory protective device designed for canines that can fit the general working dog population. 			7.743	7.863	8.030

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B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> • Development of a Combined Unit Respirator for Subterranean Operational Environments (CRUSOE) in order to provide a respiratory life support system specifically designed for prolonged underground use. • Enhancing mitigation techniques to reduce the impact of threat releases in transportation platforms and confined spaces. <p>In FY 2022, the CBRNE Subgroup also plans to complete 23 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, 2) Sustain CBRNE Units for Defense and the Homeland, 3) Integrate with the U.S. Interagency, 4) Support Relationships to Address Significant Terrorist, and 5) Enable U.S. Interagency Counterparts to Advance U.S. Influence and National Security Interests. Threats. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • Development of a wearable solution that autonomously monitors, detects, and captures biological threat agents for identification. • NIOSH certification of a 15-minute CBRN protection escape hood capable of fitting in the pocket of a suit jacket. • Development of an interface that integrates chemical detection data in real time to a central data sharing, management, and storage platform. • Systematic evaluation of gas forming reactions that could be used in improvised chemical devices. • Characterization of threat releases in underground transportation platforms and confined spaces and identify potential mitigation approaches. <p>FY 2023 Plans: For FY 2023, the CBRNE Subgroup is currently evaluating requirements and proposals and plans to initiate funding 3 new requirements.</p> <p>For FY 2023, the CBRNE Subgroup plans to continue 11 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, 2) Sustain CBRNE Units for Defense and the Homeland. 3) Integrate with the U.S. Interagency, 4) Strengthen Alliances, and 5) Enable U.S. Interagency Counterparts to Advance U.S. Influence and National Security Interests. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • Development of a respirator that combines a supplied air respirator and PAPR in a form factor that can function in subterranean environments for at least six hours • Development of a respiratory protective device designed for canines that can fit the general working dog population. • Development of a Combined Unit Respirator for Subterranean Operational Environments (CRUSOE) in order to provide a respiratory life support system specifically designed for prolonged underground use. • Enhancing mitigation techniques to reduce the impact of threat releases in transportation platforms and confined spaces. 					

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>For FY 2023, the CBRNE Subgroup plans to complete 14 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, 2) Sustain CBRNE Units for Defense and the Homeland. 3) Integrate with the U.S. Interagency, 4) Strengthen Alliances, and 5) Enable U.S. Interagency Counterparts to Advance U.S. Influence and National Security Interests. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • Portable, ruggedized Raman microscopy system capable of detecting trace explosives and other residues with minimal logistical burden for operators. • A man-portable system that can reliably detect explosives through continuous gas phase monitoring. • An advanced analytical database of improvised CB agent and homemade explosive production methods. • Assessment and further development of the Fun GCAT system to identify attempts to exploit natural and synthetic biology for nefarious purposes. • Determination of operationally deployed detection techniques and systems could be further developed or exploited to provide additional chemical detection capabilities in a search environment. <p>FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.</p>				
<p>Title: Explosive Ordnance Disposal/Explosive Operations (EOD/EXO)</p> <p>Description: The EOD/EXO Subgroup's objective is to deliver capabilities to defeat or neutralize the continuum of terrorist improvised weapons and explosive devices. EOD/EXO improves the operational capabilities of the bomb disposal and explosive operations community, consisting of military EOD, combat engineers, special operations forces, and federal, state, and local bomb squads, by developing and delivering advanced tools and technologies, and decision support information to defeat improvised terrorist devices. The EOD/EXO Subgroup identifies and prioritizes multi-agency end-user requirements in collaboration with military units, and federal, state, and local agencies. EOD/EXO actively works with vendors and end-users to deliver advanced prototype systems that provide greater efficiency and increased safety for Bomb Technicians who investigate, access, evaluate, and if needed, render safe or dispose of suspect devices. All development efforts undertaken are in support Presidential Policy Directive 17 (PPD-17), Countering Improvised Explosive Devices, and the National Bomb Squad Commanders Advisory Board (NBSCAB) National Strategic Plan.</p> <p>FY 2022 Plans: In FY 2022, the EOD/EXO Subgroup plans to initiate funding 2 projects in the area focused on Enhance Survivability for Close Combat Formations:</p> <ul style="list-style-type: none"> • Development of a training set of RFID chips that will mimic buried ordnance items, IEDs, and IED components to enhance handheld detector training, allow operators to reduce training time, and facilitate additional ad hoc mine detector training. 		7.728	5.873	6.123

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B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> • Development of machine learning (ML) algorithms that identify IEDs and ordnance using mobile computing technologies and camera systems to enhance the safety and reduce the cognitive burden of CIED operators in high threat environments. <p>In FY 2022, the EOD/EXO Subgroup plans to continue funding 3 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, and 2) Strengthen Alliances:</p> <ul style="list-style-type: none"> • Technological development, EOD/combat environment-specific ruggedization, and software training efforts for a humanoid robotic platform prototype for IED Defeat operations in urban environments. • Conducting workshops that integrate Explosive Ordnance Disposal (EOD) and Public Safety Bomb Technicians (PSBT) with engineers and roboticists to collaboratively design and develop new capabilities for counter-IED operations, counter-tunnel operations and VBIED response. • Bilateral information exchange between U.S.-based bomb technicians and members of the Israel National Police Bomb Disposal Division. <p>In FY 2022, the EOD/EXO Subgroup plans to complete funding 8 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, and 2) Integrate with the U.S. Interagency. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • Development of a full color digital night vision to aid in IED component identification and diagnostics. • Development of a luminous and infrared marking spray and dispenser for tactical marking during urban and subterranean combat operations. • Development of a smartphone or tablet-based application that will allow bomb technicians to relay IED and IED incident information graphically to fellow bomb technicians in real-time. • Development of a large, labeled, robust, and realistic IED and IED component dataset for training future machine learning and artificial intelligence-based C-IED projects. <p>FY 2023 Plans:</p> <p>In FY 2023, the EOD/EXO Subgroup plans to continue funding 3 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, and 2) Strengthen Alliances:</p> <ul style="list-style-type: none"> • Technological development, EOD/combat environment-specific ruggedization, and software training efforts for a humanoid robotic platform prototype for IED Defeat operations in urban environments. • Conducting workshops that integrate Explosive Ordnance Disposal (EOD) and Public Safety Bomb Technicians (PSTB) with engineers and roboticists to collaboratively design and develop new capabilities for counter-IED operations, counter-tunnel operations and VBIED response. 					

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>• Bilateral information exchange between U.S.-based bomb technicians and members of the Israel National Police Bomb Disposal Division.</p> <p>In FY 2023, the EOD/EXO Subgroup plans to complete funding 4 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, and 2) Integrate with the U.S. Interagency. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • Development of a training set of RFID chips that will mimic buried ordnance items, IEDs, and IED components to enhance handheld detector training, allow operators to reduce training time, and facilitate additional ad hoc mine detector training. • Development of machine learning (ML) algorithms that identify IEDs and ordnance using mobile computing technologies and camera systems to enhance the safety and reduce the cognitive burden of CIED operators in high threat environments. • Development of a large, labeled, robust, and realistic IED and IED component dataset for training future machine learning and artificial intelligence-based C-IED projects. <p>FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.</p>				
<p>Title: FORENSIC Exploitation and Identity Operations (FEIO)</p> <p>Description: The FEIO subgroup's objective is to advance combating terrorism capabilities in investigative and forensic science. FEIO supports SOF, joint, interagency, and other partners who apply investigative and forensic science methods, means, or practices to forensic intelligence or investigations. To meet this objective, the subgroup focuses on rapid research, development, test and evaluation of new and advanced technology, equipment, forensic techniques, and investigative tools, as well as development of information resources and support tools for risk-based decision-making and rapid exploitation of evidence. Projects emphasize rapid and field deoxyribonucleic acid (DNA) analysis, identification of insider threat within agencies, pre-blast and post-blast forensic examination, electronic evidence data acquisition and analysis, sensitive site exploitation, credibility assessment, forensic intelligence, and criminalistics.</p> <p>FY 2022 Plans: In FY 2022, the FEIO Subgroup plans to initiate funding 4 projects in areas focused on 1) Irregular Warfare as a Core Competency, 2) Expand the Competitive Space, 3) Integrate with the U.S. Interagency:</p> <ul style="list-style-type: none"> • Development of comprehensive non-coercive, rapport-based interviewing procedures from existing models for intelligence and law enforcement to elicit greater amounts of credible information during interrogations. • Development of a web-based search engine and archive service that monitors social media and the dark web, collects audio data on subjects using speaker recognition and speech-to-text transcription, and identifies speakers by matching voice samples to watchlists. 		6.129	6.224	6.373

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B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> • Development of an information sharing platform that enables users to submit, search, evaluate, and employ data acquisition techniques on Internet of Things and Incident Command System devices. • Development of a digital tool that provides accessibility via secured internet from remote worldwide locations to high-resolution images of US travel and identification documents for verification and forensic examinations by the DOD and other federal agencies. <p>In FY 2022, the FEIO Subgroup plans to continue funding 4 projects in areas focused on 1) Irregular Warfare as a Core Competency, 2) Expand the Competitive Space, 3) Integrate with the U.S. Interagency:</p> <ul style="list-style-type: none"> • Development of a set of techniques for evidence disclosure during investigative interviews that optimize the acquisition of credible information from the interviewee. • Development of sensors that are minimal or non-contact with the body and acquire physiological measurements for polygraph examinations and other credibility assessments. • Development of gait recognition software capable of matching and identifying human gait/walking signatures in video files regardless of camera angles. • Development of a software development kit that is compatible with all known federal government biometric file types and supports multiple programming languages for biometric records to ensure interoperability and data sharing across federal agencies. <p>In FY 2022, the FEIO Subgroup plans to complete funding 4 projects in areas focused on 1) Irregular Warfare as a Core Competency, 2) Expand the Competitive Space, 3) Integrate with the U.S. Interagency:</p> <ul style="list-style-type: none"> • Development and fielding of techniques that increase the cognitive load in subjects being interviewed to obtain more information and make better credibility assessments. • Development and fielding of an electro-optical and infrared handheld prototype system that in daytime and nighttime conditions collects imagery of faces and objects for human identification and scene analysis. • Development and fielding of a flatbed laser light scanning system that captures pre- and post-processed latent fingerprints and can be used in laboratory and field environments. • Development and fielding of a software application that evaluates data from polygraph examinations to determine countermeasures were employed by the interviewee. <p>FY 2023 Plans: In FY 2023, the FEIO Subgroup plans to initiate funding 4 projects in areas focused on 1) Irregular Warfare as a Core Competency, 2) Expand the Competitive Space, 3) Integrate with the U.S. Interagency:</p>					

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B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> • Development of rapid DNA profiling of samples for sensitive sites and crimes to produce immediate results for field agents. • Development of an advanced multispectral surveillance and technical device that uses ultraviolet, visible, and infrared light for covert forensic detection and identification. • Development of automated methods to locate and collect user specified images from social media and the dark web. • Development of a reference DNA swab instrument that automates the preparation and cutting of buccal swabs during DNA processing and analysis. <p>In FY 2023, the FEIO Subgroup plans to complete funding 8 projects in areas focused on 1) Irregular Warfare as a Core Competency, 2) Expand the Competitive Space, 3) Integrate with the U.S. Interagency. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • Development and fielding of a set of techniques for evidence disclosure during investigative interviews that optimize the acquisition of credible information from the interviewee. • Development and fielding of a web-based search engine and archive service that monitors social media and the dark web, collects audio data on subjects using speaker recognition and speech-to-text transcription, and identifies speakers by matching voice samples to watchlists • Development and fielding of a software development kit that is compatible with all known federal government biometric file types and supports multiple programming languages for biometric records to ensure interoperability and data sharing across federal agencies. <p>FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.</p>					
<p>Title: Indirect Influence and Competition (I2C)</p> <p>Description: The Indirect Influence and Competition (I2C) Subgroup's objective is to develop new concepts and capabilities for warfighters and interagency partners. In accordance with the National Defense Strategy, projects emphasize preparation to defeat adversaries, including great powers' proxies and irregular surrogates, and succeed in a wide range of contingencies in both physical and informational domains. In order to establish and reinforce IW as a core competency, I2C will engage in operational assessment, concept development, and independent validation of unique prototype capabilities to identify, confront, and defeat evolving threats across the range of military operations as well as those below the threshold of conventional war.</p> <p>FY 2022 Plans: In FY 2022, the I2C Subgroup plans to initiate or continue funding 3 projects in areas focused on irregular warfare as a core competency. Examples include, but are not limited to:</p>			5.989	6.082	6.121

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B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> • Two (2) programs of instruction (POIs) and supporting materials for a Civil Affairs in Irregular Warfare and Governance Support course that draws upon existing courses and publications from U.S. Army Special Operations Command (USASOC), U.S. Army John F. Kennedy Special Warfare Center and School (USAJFKSWCS), Joint Special Operations University (JSOU), interagency courses, and open sources. • An application for the Android Tactical Assault Kit (ATAK) that allows users to share and visualize civil information across the Interagency (IA) necessary to drive whole-of-government influence operations. • A SOF Enabled Cyber Toolkit to provide SOF an enterprise-level ability to provide "last mile" cyber-enabled activities to bridge the gap between tactical and higher echelons of cyber capability. <p>In FY 2022, the I2C Subgroup plans to complete 10 projects in areas focused on 1) expanding the competitive space, 2) irregular warfare as a core competency, 3) strengthening alliances, and 4) sustaining combating terrorism. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • A prototype, user-friendly, software platform to reliably detect the presence of synthetically generated text that is designed to erode public trust in reliable sources or for disinformation campaigns. • A project to support MISO operators by integrating cutting edge commercial technologies and applications into a toolkit that consist of advanced equipment that reflect the technology and communications infrastructure in the diverse set of environments in which MISO operates to expand the competitive space and capabilities of our partners. • Small containers, or "Air Delivery Vehicles" (ADVs), that can be safely air dropped individually or in clusters from offset locations to deliver any electronic, medical, or other device that is able to fit within its payload parameters. • A Remote Advise and Assist (RAA) project to examine conditions that would lead to successful RAA operations in a full spectrum environment and then develop and field advanced RAA prototypes in order to test the ability of advisors to continue mentoring partners remotely. <p>FY 2023 Plans:</p> <p>For FY 2023, the I2C Subgroup is currently evaluating proposals, and plans to initiate funding 5 new requirements. Also, in FY23, the I2C Subgroup plans to complete 3 projects in areas focused on irregular warfare as a core competency. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • Two (2) programs of instruction (POIs) and supporting materials for a Civil Affairs in Irregular Warfare and Governance Support course that draws upon existing courses and publications from U.S. Army Special Operations Command (USASOC), U.S. Army John F. Kennedy Special Warfare Center and School (USAJFKSWCS), Joint Special Operations University (JSOU), interagency courses, and open sources. • An application for the Android Tactical Assault Kit (ATAK) that allows users to share and visualize civil information across the Interagency (IA) necessary to drive whole-of-government influence operations. 					

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> • A SOF Enabled Cyber Toolkit to provide SOF an enterprise-level ability to provide "last mile" cyber-enabled activities to bridge the gap between tactical and higher echelons of cyber capability. <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> There is no significant change between FY 2022 and FY 2023.</p>			
<p><i>Title:</i> Protection, Survivability, and Recovery (PSR)</p> <p><i>Description:</i> The Protection, Survivability, and Recovery Subgroup's objective is to develop new equipment, reference tools, and standards to improve the protection of personnel. Projects focus on putting innovative tools such as automated information management systems, communication devices, tagging, tracking and locating devices, mobile surveillance systems, as well as personal and vehicle protection equipment in the hands of personnel.</p> <p><i>FY 2022 Plans:</i> For FY 2022, the PSR Subgroup is currently evaluating requirements and proposals in C-UAS detection, identification, tracking, and mitigation to increase capability in urban areas and against DoD Group 1 to Group 3 UAS and plans to initiate funding new requirements in collaboration with Israel. Also in FY 2022, the PSR Subgroup plans to initiate funding 6 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, and 2) Integrate with the U.S. Interagency. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • Development of a standardized transparent armor for non-tactical armored vehicles with approximately 30% reduction in weight and thickness while achieving a threshold ballistic rating of VPAM VR9. • Development of a standard, ceramic-faced ballistic plate that will result in a fully densified ceramic in a flat panel that can be used in a highly curved ceramic system, for use in female fit body armor. • Development of a radar system to detect small UAS in urban environments. <p>In FY 2022, the PSR Subgroup plans to continue funding 6 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, and 2) Integrate with the U.S. Interagency. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • Development of an eye protection system in the form of a face shield or glasses that provides the operator protection from frequencies of laser light while allowing enough visible light for the operator to see. • Development of a tracking device that will work in disadvantaged/denied GPS environments with no additional equipment (e.g., geo-located tags, repeaters, signal boosters). • Test and evaluation of two C-UAS radar systems and of a capture/carry UAS. <p>In FY 2022, the PSR Subgroup plans to complete funding 13 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, and 2) Integrate with the U.S. Interagency. Examples include, but are not limited to:</p>		32.723	33.538
			6.444

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Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603122D8Z I Combating Terrorism Technology Support	Project (Number/Name) 484 I Combating Terrorism Technology Support (CTTS)		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none">Investigation of the root causes of poor armor fit among U.S law enforcement agencies and identify corrective actions and standard procedures to ensure proper fit to body armor users across the anthropometric spectrum of law enforcement professionals.Development of enhanced performance personal body armor and production processes to enable successful completion of first articles tests and subsequent fielding.Development of a capture/carry C-UAS system. <p>FY 2023 Plans: For FY 2023, the PSR Subgroup is currently evaluating requirements and proposals and plans to initiate funding 5 new requirements. Also, in FY 2023, the PSR Subgroup plans to initiate funding 4 projects in the areas focused on 1) Enhance Survivability for Close Combat Formations, and 2) Integrate with the U.S. Interagency.</p> <ul style="list-style-type: none">Development of advanced systems for use in law enforcement and military applications to increase survivability of the operator.Development to increase ballistic protection and reduce weight for body armor.Development of an increased situational awareness system for law enforcement and military applications.Development of advanced materials for use in vehicle armor systems for all federal government. <p>In FY 2023, the PSR Subgroup plans to continue funding 4 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, and 2) Integrate with the U.S. Interagency.</p> <ul style="list-style-type: none">Development of air based optical detection of drones.Development of advanced ground based detection systems to detect small UAS.Development of advanced optical ground based detection systems to detect small UAS.Development of a radar system to detect small UAS in urban environments. <p>In FY 2023, the PSR Subgroup plans to complete funding 9 projects in areas focused on 1) Enhance Survivability for Close Combat Formations, and 2) Integrate with the U.S. Interagency. Examples include, but are not limited to:</p> <ul style="list-style-type: none">Development of a standardized transparent armor for non-tactical armored vehicles with approximately 30% reduction in weight and thickness while achieving a threshold ballistic rating of VPAM VR9.Development of a standard, ceramic-faced ballistic plate that will result in a fully densified ceramic in a flat panel that can be used in a highly curved ceramic system, for use in female fit body armor.Development of an eye protection system in the form of a face shield or glasses that provides the operator protection from frequencies of laser light while allowing enough visible light for the operator to see.Development of a tracking device that will work in disadvantaged/denied GPS environments with no additional equipment (e.g., geo-located tags, repeaters, signal boosters).					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603122D8Z / <i>Combating Terrorism Technology Support</i>		Project (Number/Name) 484 / <i>Combating Terrorism Technology Support (CTTS)</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> • Test and evaluation of two C-UAS radar systems and of a capture/carry UAS • Development of a standard, low cost test fixture and operating instructions to assess the performance and efficacy of non-pneumatic limb tourniquets. <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2022 includes Congressional Add funding in support of Counter UAS technologies in collaboration with Israel.</p>					
<p>Title: Expeditionary Force Protection (EFP)</p> <p>Description: Rapidly develop and transition expeditionary force protection capabilities and technologies to support forward deployed and domestic first responders, military, interagency, and international partners in the focus areas of Blast Effects and Mitigation; Maritime Security; Screening, Observation, Detection, and Protection; and, Subterranean Activities. Emphasize these technology development efforts primarily for expeditionary advance based operations, forward operating bases, along the U.S. borders, mass transportation and commerce nodes, in maritime port and littoral environments, U.S. embassies and consulates, and in support of large-scale public venues.</p> <p>FY 2022 Plans: For FY 2022, the EFP Subgroup is currently evaluating 2 requirements and proposals to develop enhanced capabilities for Subterranean Operations in the areas of Hard Target Defeat and Hardened Deeply Buried Target sites and plans to initiate funding new requirements in collaboration with Israel. Also in FY 2022, the EFP Subgroup plans to initiate funding 33 projects in areas focused on 1) Irregular Warfare as a Core Competency, 2) Enhance Survivability for Personnel and Facilities 3) Strengthen Alliances, and 4) Support Relationships to Address Significant Terrorist Threats. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • Development of six (6) subterranean fixtures for testing emerging technologies. • Deliver an analytic tool with expanded capability with the incorporation of machine learning and associated training modules that will predict specific subterranean activities. • Adaptation of an adaptive active seismic to a more suitable hardened vehicle currently in the DoD inventory to improve survivability and force protection. • Development of an intelligence, surveillance, and reconnaissance unmanned aerial system (UAS) asset capable of wide area underground void detection using thermal imagery. • Development of a load configuration on the existing United States Army Special Operations Command and Army program of record to provide a vehicle capable of supporting advanced forced entry of specific subterranean/hardened deeply buried targets. • Development of an advanced exothermic capability on the existing United States Army Special Operations Command and Army program of record to provide a Liquid Oxygen conversion to pure oxygen for exothermic entry into specific subterranean/hard target defeat targets. • Development and evaluation of a communication system that will provide real time situational awareness and blue force tracking among a network of confined spaces. 			33.575	54.267	6.435

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B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> • A man-dive form-fit-function testing of industry prototype diver electric resistance active thermal systems in support of long endurance, cold water, and combat diving operations. • Development of an inertial navigation system using a unique communications capability to provide units of action with the ability to project exact location of friendly forces in subterranean locations. <p>In FY 2022, the EFP Subgroup plans to continue funding 19 projects in areas focused on 1) Irregular Warfare as a Core Competency, 2) Enhance Survivability for Personnel and Facilities and 3) Strengthen Alliances. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • A framework to rapidly evaluate new counter tunnel concepts, technologies and applications. • Adaptation of a proven land system to an airborne detection system. • Test and evaluation of an interoperable, detect-to-defeat capability to provide waterside security (e.g., ports, harbors, and expeditionary advanced base operations) and against underwater littoral threats. • Development and evaluation of a novel ship-to-shore fuel transport system with two different designs for an amphibious towable container that mitigates risk to personnel and fuel loss in the event of an attack. • Hosting bi-annual data exchange with foreign partners to exchange research/info on physical protection of facilities, to include but not limited to: entry control points, vehicle barriers, blast/forced entry mitigation, and sensitive material destruction. • Leveraging assets and capabilities in the area of Homemade Explosives (HME) materials characterization to support research efforts. <p>In FY 2022, the EFP Subgroup plans to complete funding 46 projects in areas focused on 1) Irregular Warfare as a Core Competency, 2) Enhance Survivability for Personnel and Facilities, 3) Integrate with the U.S. Interagency, 4) Strengthen Alliances, and 5) Support Relationships to Address Significant Terrorist Threats. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • Development of a platform that utilizes a network of airborne sensors to detect subterranean targets. • Deliver an analytic tool that will predict specific subterranean activities. • Development and testing of a less-than-lethal-weapon (LLW) prototype that fires pepper projectiles with improved accuracy at extended ranges, enabling engagement of adversaries from a safer distance. • Test and evaluation of Ethylene-vinyl Acetate (EVA) laminated glass that will determine its blast protection performance as compared to Polyvinyl Butyral (PVB) laminated glass. • Operational test and evaluation of mobile lateral and vertical scanning technology to locate specific subterranean targets. • Development and testing of a small-unmanned aerial system (sUAS) to safely conduct reconnaissance of discovered illicit sites and conduct routine inspections. • Development of a self-positioning system/blue force tracking of personnel in Global Positioning System (GPS) denied environments. 					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
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B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> Integration of Human Injury Prediction (HIP) for Vulnerability Assessment and Protection Option (VAPO) 7 to effectively and accurately model the effects of an explosive event. These effects include air blast propagation, fragmentation effects and patterns, human injury models, etc. Development and testing of a handheld anomaly detection wand to detect both non-metallic and metallic objects concealed under or in clothing to support checkpoint screening and security personnel. Development and testing of false alarm rate testing of an automatic target recognition system for on the move, standoff Improvised Explosive Device (IED) detection. <p>FY 2023 Plans: For FY 2023, the EFP Subgroup is currently evaluating 1 requirement and proposals and plans to initiate funding to develop an electric tactical ground mobility platform for operations in subterranean environments. Also in FY 2023, the EFP Subgroup plans to initiate funding 6 projects in areas focused on 1) Irregular Warfare as a Core Competency, 2) Enhance Survivability for Personnel and Facilities, and 3) Strengthen Alliances:</p> <ul style="list-style-type: none"> Development of a lighter and smaller, tactical and easy-to-use tool, which will enable an operator to monitor obstacles from a safe distance, in underground confined structures. Integration in to other unmanned aerial system (UAS) platforms in Department of Defense use. Development of four (4) enhanced subterranean fixtures, in different specific geologies, for testing emerging technologies. Integration of a high capacity exothermic capability reducing the load and increasing the thermic cutting capacity. Development of a signal processing acoustic swimmer detection system by transmitting active acoustic swimmer sonar signals to a trained dolphin in a remote pen resulting in quicker (minutes to seconds) and more accurate detection for classification of underwater threats. A subterranean operations planning course that will provide Department of Defense and Interagency an expeditionary training capability providing a mobile training team. <p>In FY 2023, the EFP Subgroup plans to continue funding 25 projects in areas focused on 1) Irregular Warfare as a Core Competency, 2) Enhance Survivability for Personnel and Facilities and 3) Strengthen Alliances, and 4) Support Relationships to Address Significant terrorist Threats. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> Test and evaluation of an interoperable, detect-to-defeat capability to provide waterside security (e.g. ports, harbors, and expeditionary advanced base operations) and against underwater littoral threats. Development of an advanced exothermic capability on the existing United States Army Special Operations Command and Army program of record to provide a Liquid Oxygen conversion to pure oxygen for exothermic entry into specific subterranean/hard target defeat targets. 					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
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B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> • Hosting bi-annual data exchange with foreign partners to exchange research/info on physical protection of facilities, to include but not limited to: entry control points, vehicle barriers, blast/forced entry mitigation, and sensitive material destruction. • Leveraging assets and capabilities in the area of Homemade Explosives (HME) materials characterization to support research efforts. • A man-dive form-fit-function testing of industry prototype diver electric resistance active thermal systems in support of long endurance, cold water, and combat diving operations. • Development of an inertial navigation system using a unique communications capability to provide units of action with the ability to project exact location of friendly forces in subterranean locations. <p>In FY 2023, the EFP Subgroup plans to complete funding 28 projects in areas focused on 1) Irregular Warfare as a Core Competency, 2) Enhance Survivability for Personnel and Facilities and 3) Strengthen Alliances, and 4) Support Relationships to Address Significant terrorist Threats. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • Adaptation of an adaptive active seismic to a more suitable hardened vehicle currently in the Department of Defense inventory to improve survivability and force protection. • Deliver six (6) subterranean fixtures for testing emerging technologies. • Deliver an analytic tool with expanded capability with the incorporation of machine learning and associated training modules that will predict specific subterranean activities. • Development of an intelligence, surveillance, and reconnaissance unmanned aerial system (UAS) asset capable of wide area underground void detection using thermal imagery. • Development of a load configuration on the existing United States Army Special Operations Command and Army program of record to provide a vehicle capable of supporting advanced forced entry of specific subterranean/hardened deeply buried targets. • Development and evaluation of a communication system that will provide real time situational awareness and blue force tracking among a network of confined spaces • A framework to rapidly evaluate new counter tunnel concepts, technologies and applications. • Adaptation of a proven land system to an airborne detection system. • Development and evaluation of a novel ship-to-shore fuel transport system with a down select of one tire design for an amphibious towable container that mitigates risk to personnel and fuel loss in the event of an attack. <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2022 includes Congressional Add funding in support of Counter Tunnel technologies in collaboration with Israel.</p>					
Title: SURVEILLANCE, COLLECTION AND OPERATIONS SUPPORT			8.465	8.625	9.758
Description: The Surveillance, Collection, and Operations Support (SCOS) Subgroup's objective is to identify high-priority user requirements and special technology initiatives focused primarily on supporting Irregular Warfare and Counter Terrorism					

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B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>Operations. SCOS projects enhance U.S. intelligence capabilities to conduct retaliatory or preemptive operations and reduce the capabilities and support available to Violent Extremist Organizations and other adversaries as directed.</p> <p>FY 2022 Plans: In FY 2022, the SCOS Subgroup plans to initiate or continue funding 13 projects in areas focused on 1) enhancing survivability for close combat forces, 2) expanding the competitive space, and 3) strengthening alliances. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • A classified Signature Management project to develop a Persona Management capability. • A classified Technical Collection project to develop new communication protocols that support counter surveillance operations. • A classified Special Communications project to develop new Thin Film Antenna technical capability. • A classified Signature Management project to develop new facial recognition, risk reduction capability. • A classified Signature Management AI project to develop a CCTV risk reduction capability. <p>In FY 2022, the SCOS Subgroup also plans to complete 4 projects in areas focused on 1) enhancing survivability for close combat forces, and 2) strengthening alliances. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • A single compact, gimbaled next generation Hyperspectral Imagery (HSI) aerial sensor in both SWIR and LWIR wavebands and provide industry standard data outputs. • A classified Surveillance and Signature Management effort to develop a low observable HD AV system. • A low-profile tactical radio system with optimized performance. The system will enable ready exchange of information between mobile tactical users in a form factor that provides the flexibility to customize the configuration and achieve communications without or in an area with degraded infrastructure. <p>FY 2023 Plans: In addition to evaluating proposals for 8 new requirements in FY 2023, the SCOS Subgroup plans to initiate or continue funding 4 projects in areas focused on expanding the competitive space. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • Enhanced capabilities against vehicular signals of interest and Cyber Convergent Technologies. • Field technical surveillance capabilities against peer/ near peer adversaries and terrorist threats through development or enhancement of Multi-intelligence collection systems, customized tagging, tracking and locating capabilities and counter surveillance capabilities. • Non-standard and specialized communications and technical collection capabilities to combat terrorists and other highly technical adversaries. <p>In FY 2023, the SCOS Subgroup also plans to complete 13 projects in areas focused on 1) enhancing survivability for close combat forces, 2) expanding the competitive space, and 3) strengthening alliances. Examples include, but are not limited to:</p>					

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> • A classified Integrated Air Defense Geo-Location Technical Collection effort. • A classified Technical Collection project to support Tagging, Tracking and Locating (TTL) operations. • A classified Special Communications project to develop an alternate cell technology, communications path. • A classified Cyber and Convergent technology project to develop a Data Retrieval capability. • A classified Signature Management Project to develop a new Signature Reduction capability. 			
FY 2022 to FY 2023 Increase/Decrease Statement: Increase reflective of Departmental priorities in special communications, cyber technology, and signature management.			
Title: Tactical Offensive Support (TOS)		8.940	8.944
Description: The Tactical Offensive Support (TOS) Subgroup's mission is to execute rapid research and development projects and deliver superior capabilities with training to DoD and Interagency special operations tactical teams conducting Irregular Warfare against all adversaries, including Great Power competitors and non-state actors. This includes federal law enforcement agencies to combat domestic terrorism. The development focus is enabling small tactical units by providing state of the art overmatch capabilities in: Offensive Systems; Tactical Communications; Tactical Reconnaissance, Surveillance, and Target Acquisition Systems; and Specialized Infiltration, Access and Exfiltration Systems.			10.258
FY 2022 Plans: In FY 2022, the TOS Subgroup plans to initiate or continue funding 9 projects in areas focused on 1) enhancing lethality for close combat formations, and 2) enhancing survivability for personnel and facilities. Examples include, but are not limited to: <ul style="list-style-type: none"> • Testing dual-purpose improvised conventional munitions that comply with US Safety standards and the US Cluster Munitions policy of less than 1% UXO after firing the munition. • A low cost, hand-launched, fast VTOL loitering munition that employs Electro-Optical and Infrared sensors for both day and night operations to improve SOF force protection and rapid attack capability. • An advanced intermediate-caliber cartridge, side-fed lightweight assault machinegun that allows machine gunners to provide effective volumes of fire and on-target performance at improved ranges. • An affordable, compact, lightweight Laser Range Finder (LRF) attachment that can be mounted to a weapon's optics or to a spotting scope to enable the user to rapidly acquire targets. 			
In FY 2022, the TOS Subgroup plans to complete 21 projects in areas focused on 1) enhancing lethality for close combat formations, and 2) enhancing survivability for personnel and facilities. Examples include, but are not limited to: <ul style="list-style-type: none"> • A next generation Lightweight Medium Machine Gun (LWMMG) and lightweight ammunition to give operators a distinct advantage in both the extended and close-in fight and be able to transition rapidly from mounted operations to dismounted operations. 			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none">• A family of intermediate caliber weapon systems, including ammunition, for use in close quarters combat, marksmen, and individual weapon system roles to improve probability of hit.• A hybrid dual-channel medium-range weapon sight to perform in the near infrared and long wave infrared, that provides a tactical advantage in detection and interdiction of targets at distance.• A beyond line of sight loitering aerial missile, that is capable of locating and engaging enemy targets, armored and unarmored vehicles. The missile will provide advanced tactical situational awareness and real-time video display that controls the missile throughout its mission using an intuitive interface with automated modes which relieve the operator from most of the burdens associated with piloting an airborne loitering missile.• An advanced digital force protection tool that enables operators to temporarily disrupt local COTS wired and wireless networks, but which improves upon existing frequency scanning and mapping capabilities to more quickly and accurately locate the Wireless Access Point (AP). <p>FY 2023 Plans: For FY 2023, the TOS Subgroup is currently evaluating proposals, and plans to initiate funding 3 new requirements. Also, in FY 2023, the TOS Subgroup plans to continue or complete funding 9 projects in areas focused on 1) enhancing lethality for close combat formations, and 2) enhancing survivability for personnel and facilities. Examples include, but are not limited to:</p> <ul style="list-style-type: none">• An evaluation of stabilized weapon mounts on moving host platforms to increase high probability of hit.• An advanced modular, Vertical Take-Off and Landing (VTOL) platform that allows operators to remotely detect, identify, track, and destroy a variety of targets throughout complex urban terrain, utilizing an organic, highly maneuverable sUAS.• A tactical deployment and recovery capability for US and UK Navy SOF surface, subsurface and air assets that increases environmental protection and signature reduction while ensuring direct interoperability between US and UK forces.• A voice control operating system for Advanced small Unmanned Aerial Systems (sUAS), leveraging Artificial Intelligence and Machine Learning to deliver an End User Device, that replaces traditional Operational Control Unit (OCU) and joystick IOT improve decision making capabilities and problem solving, thereby improving operator reaction time and increasing overall lethality. <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase reflective of departmental priorities in lethality, survivability, and offensive sUAS.</p>				
Title: Human Performance and Training (HPT) Description: The Human Performance and Training (HPT) Subgroup's objective is to provide SOF, DoD, and the interagency with agile, rapid response, R&D capabilities for optimizing performance in the operational environment and increasing readiness for tomorrow's threats. To meet this objective, the subgroup develops human-centered technologies that are performance outcome focused in the areas of immersive learning technology, human performance optimization, and innovative training and educational		5.333	5.414	6.764

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>concepts. HPT's capabilities are implemented globally to prepare for critical missions in any operational environment to identify, disrupt, and defeat threats.</p> <p>FY 2022 Plans:</p> <p>In FY 2022, the HPT Subgroup plans to initiate and continue 6 projects in areas focused on 1) irregular warfare as a core competency, and 2) enhancing survivability for personnel and facilities. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • A Program of Instruction to teach SOF Operators advanced cyber and electronic warfare skills for cyber defense, resilience, and the increased integration of cyber capabilities into the full spectrum of military operations. • A multi-sensory (e.g., visual, auditory, tactile) and immersive military freefall jump master simulator to enhance classroom training and rehearsal of spotting techniques and aircraft procedures over virtual drop zones (DZ) modeled after real world DZs prior to going up in the air. • An Advanced Cyber Physical Testbeds that integrate real-world sophisticated hardware and software rather than virtualized instantiations of peer and near-peer adversaries' operating environments to train SOF cyber operators to conduct full spectrum cyber effects operations on par with peer and near-peer adversaries. • A training course focused on teaching SOF operators how to think critically through their problem set and mission to design, build, and employ customized small UAS systems utilizing COTS components procured locally. <p>In FY 2022, the HPT Subgroup also plans to complete 7 projects in areas focused on 1) irregular warfare as a core competency, 2) enhancing lethality for close combat formations, 3) enhancing survivability for personnel and facilities, and 4) sustaining CBRNE units for defense and the homeland. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • A synthetic Internet sandbox to enable intelligence analysts and information operations personnel to train on tools and methodologies for the collection, analysis, and exploitation of adversaries' online information, as well as engaging in large-scale Unconventional Warfare (UW) exercises, while mitigating the challenges and risks associated with training on the publicly visible Internet. • An intelligent tutoring system that will instruct Soldiers in how to integrate and interpret operations, intelligence, and civil information within the Common Operating Picture for enhanced situational awareness and reduced cognitive workload. • An AC-130J Virtual Reality Combat Mission Trainer to enable operational crews to engage in mission tasks within a simulated environment that replicates sensory information of real-world mission performance found in joint mission essential task (JMET) environments. • An immersive mixed reality (MR) simulator for training specific emergency procedures (EPs) for the MK-16 self-contained diving rig often used for Mine Countermeasures operations. <p>FY 2023 Plans:</p>			

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B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>In addition to evaluating proposals for 4 new requirements in FY 2023, the HPT Subgroup plans to initiate or continue funding 7 projects in areas focused on 1) irregular warfare as a core competency, 2) enhancing lethality for close combat formations, and 3) enhancing survivability for personnel and facilities. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • A biometric-based sensor hub and tracking dashboard for real time monitoring of trainee stress levels to enhance instructors' ability to adapt training effectiveness based off individual trainee stress responses. • A system that projects live role players into a close quarters combat scenario to provide more realistic training environments utilizing live weapons (e.g. shoot/don't shoot) while employing physiological sensors to measure how cognitive agility training can improve stress responses and Operator ability to adapt quickly between high and low stress activities. • An interactive and dynamic Full Motion Video (FMV) Processing Exploitation, and Dissemination (PED) desktop training simulator and program of instruction that trains SOF analysts to SOF-specific FMV PED tactics, techniques, and procedures; methodologies; and product standards. • A training course built to enhance SOF digital awareness and security while traveling OCONUS considering Great Power Competition environment threats and vulnerabilities. <p>In FY 2023, the HPT Subgroup also plans to complete 4 projects in areas focused on enhancing survivability for personnel and facilities. Examples include, but are not limited to:</p> <ul style="list-style-type: none"> • Accurate and realistic 3D virtual cites for immersive, virtual reality-based pre-deployment operations training, mission planning, and mission rehearsal. • An Advanced Cyber Physical Testbeds that integrate real-world sophisticated hardware and software rather than virtualized instantiations of peer and near-peer adversaries' operating environments to train SOF cyber operators to conduct full spectrum cyber effects operations on par with peer and near-peer adversaries. • A simulation-based immersive training to expose inexperienced military working dog (MWD) handlers to a broad range of tactical decision-making scenarios and dog behaviors in preparation for working with a real-world MWD. <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> Increase reflective of Departmental priorities in human performance optimization, cyber training, and immersive learning technology.</p>					
Accomplishments/Planned Programs Subtotals			121.594	141.876	72.614
C. Other Program Funding Summary (\$ in Millions)					
N/A					
Remarks					
N/A					

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D. Acquisition Strategy N/A		

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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
485: Combating Terrorism Technology Support (CTTS) - OCO	0.000	19.288	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note CTTS OCO Funding												
A. Mission Description and Budget Item Justification The Combating Terrorism Technical Support (CTTS) program supports the National Defense Strategy (NDS) and will give those identified peer-to-peer high interest areas increased priority. CTTS also recognizes that many of the combating terrorism requirements already supports many of these high interest areas; to include, increasing lethal capability of U.S. forces at the squad and small unit level; countering Small Unmanned Aerial Systems (drones) overseas and domestically; tunnel detection and mapping in theater and along the Southwest U.S. border; novel body and vehicle armor; detecting and mitigating novel chemical threats against commercial transportation; telematics; covert communications; and the use of machine learning and artificial intelligence. CTTS continues to focus its R&D activities to rapidly fill the immediate and critical capability gaps of military operators, intelligence analysts, and first responders that are at the leading edge of the fight or response. The FY 2021 Congressionally directed and funded cooperative 50-50 cost sharing RDT&E projects with Israel to address countering small unmanned aerial vehicles and enhance detection of and operations in tunnels will continue in FY 2022 or until the funds are expended.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: Expeditionary Force Protection (EFP)									19.288	-	-	
Description: Rapidly develop and transition expeditionary force protection capabilities and technologies to support forward deployed and domestic first responders, military, interagency, and international partners in the focus areas of Blast Effects and Mitigation; Maritime Security; Screening, Observation, Detection, and Protection; and, Subterranean Activities. Emphasize these technology development efforts primarily for expeditionary advance based operations, forward operating bases, along the U.S. borders, mass transportation and commerce nodes, in maritime port and littoral environments, U.S. embassies and consulates, and in support of large-scale public venues.												
Accomplishments/Planned Programs Subtotals									19.288	-	-	
C. Other Program Funding Summary (\$ in Millions) N/A												
Remarks												

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603122D8Z / Combating Terrorism Technology Support	Project (Number/Name) 485 / Combating Terrorism Technology Support (CTTS) - OCO
D. Acquisition Strategy N/A		

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603122D8Z / <i>Combating Terrorism Technology Support</i>	Project (Number/Name) 485 / <i>Combating Terrorism Technology Support (CTTS) - OCO</i>	

FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Expeditionary Force Protection (EFP)																												
Expeditionary Force Protection (EFP)																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603122D8Z / <i>Combating Terrorism Technology Support</i>	Project (Number/Name) 485 / <i>Combating Terrorism Technology Support (CTTS) - OCO</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Expeditionary Force Protection (EFP)</i>				
Expeditionary Force Protection (EFP)	1	2021	4	2022

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)					R-1 Program Element (Number/Name) PE 0603133D8Z / Foreign Comparative Testing							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	134.592	23.651	25.352	26.802	-	26.802	27.554	28.110	28.701	29.275	-	-
313: Foreign Comparative Testing	134.592	23.651	25.352	26.802	-	26.802	27.554	28.110	28.701	29.275	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression, Defend the Homeland, and Build Sustainable and Long-Term Advantage.

The Foreign Comparative Testing (FCT) Program increases Joint Force readiness and lethality by providing near-term solutions to existing and future Department of Defense (DoD) capability gaps by leveraging the Research & Development (R&D) investments of allied nations and coalition partners. The FCT Program Element (PE) evaluates prototypes derived from allied and partner nation technologies to provide the U.S. Armed Services, U.S. Special Operations Command (USSOCOM), and Defense Agencies capabilities to counter emerging threats. The FCT's broad reach across our allies and friendly foreign countries enables development of innovative, cost effective, and interoperable solutions to meet needs communicated by the Joint Chiefs of Staff and the Combatant Commanders. Military Services and USSOCOM jointly conduct FCT projects. FCT strengthens alliances by facilitating international collaboration and evaluating technologies that increase interoperability while serving as a catalyst for teaming and other business relationships between international and domestic industries.

Partner nations recognize the long-term value of the "two-way street" for Defense procurements for which FCT provides an avenue. Numerous successful projects have resulted in the licensed production of a qualified foreign item in the United States, including the creation of jobs and contributions to local economies. To date, companies from 34 states have benefited from FCT projects. FCT supports DoD best practices by incentivizing the use of prototyping and experimentation in advancing technological solutions to warfighter problems and acts as a hedge against threat developments. FCT enhances affordability by reducing development costs and risk, accelerating acquisition timelines, and increasing competition. Through increasing Joint lethality and readiness, strengthening alliances, and delivering affordable performance on accelerated timelines, FCT supports all three lines of effort outlined in the National Defense Strategy, and supports the Under Secretary of Defense for Research and Engineering (OUSD R&E) critical technology areas. Authorized by Title 10, U.S. Code, Section 2350a (g), the FCT program is managed by the Office of the Under Secretary of Defense for Research and Engineering (OUSD R&E), Mission Prototypes (MP) Office.

Measurable Outcomes:

-FCT projects will demonstrate capability objectives within 12-36 months.

-Over its 41-year history, FCT has a transition rate of 59% (373 out of 637) for completed projects. Of the 373 projects that tested successful, 289 or 77% resulted in follow on procurements of over \$12.025 billion.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603133D8Z I <i>Foreign Comparative Testing</i>
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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	25.115	25.432	0.000	-	0.000
Current President's Budget	23.651	25.352	26.802	-	26.802
Total Adjustments	-1.464	-0.080	26.802	-	26.802
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.000	-			
• SBIR/STTR Transfer	-0.459	-			
• Other Program Adjustments	-0.005	-	0.925	-	0.925
• FFRDC Reduction	-	-0.080	-	-	-
• Adjustments to Budget Year	-	-	25.877	-	25.877

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Below Threshold Reprogramming of one million FY 2021 funding supported higher OSD directed priorities. \

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603133D8Z / Foreign Comparative Testing				Project (Number/Name) 313 / Foreign Comparative Testing			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
313: Foreign Comparative Testing	134.592	23.651	25.352	26.802	-	26.802	27.554	28.110	28.701	29.275	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The FCT Program Element funding supports projects that test and evaluate innovative technologies already developed by partner nations and in doing so, directly aligns to the National Defense Strategy lines of effort: increasing Joint lethality in contested environments, strengthening partnerships, and fostering reform through delivery of capability at the speed of relevance. Program portfolio aligns with the critical technology areas were applicable. Individual projects typically average less than \$1.000 million each and complete within 12-36 months. Projects are proposed by the Military Services and USSOCOM and are selected using a merit-based process that identifies the most promising, innovative, and cost-effective solutions to validate warfighter requirements, with an emphasis on transitioning technologies into current or future programs of record. Projects selection is based on potential to yield cost, schedule, or performance improvements over the status quo.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: More Reliable, Longer Endurance, More Power Unmanned Aerial Systems (UAS) (Army)									0.096	-	-	
Description: This project comparatively tests the performance of the Danielson Trident 100TD2 engine versus the existing MQ-5B Hunter engine. The Trident 100TD2 is a candidate engine for use in next generation UAS and new production of existing UAS for foreign military sales because of its improved reliability, increased power, and reduced life cycle costs. This project enhances DoD capabilities in the Autonomous Systems focus area. If successful, the Army will pursue flight demonstration prior to insertion into the Army’s UAS program of record for fielding on MQ-5B Hunter. This project completed legacy baseline testing in FY 2019. The scope was modified and altitude test of engine with poor quality fuel was performed in the third quarter of FY 2021. Performance testing completed in the fourth quarter of FY 2021. Test report and close out report was completed the first quarter of FY 2022 with FY 2021 funds.												
Title: Multi-Mission Weaponized Soldier - Unmanned Aerial System (Army)									1.055	-	-	
Description: This project evaluates an Unmanned Aerial System (UAS) in a 40-millimeter grenade form factor with a modular payload. The system operated by an individual soldier, has a range of up to 12 kilometers, and can fly for up to 12 minutes. This technology provides non-lethal situational awareness and lethal indirect fire support against enemies in defilade or behind walls. This project enhances DoD capabilities in the Autonomous Systems focus area. If successful, this technology will transition to the Joint Munitions & Lethality Life Cycle Management Command for follow-on operational evaluations. This project initiated test planning and contract preparation in FY 2019. Received test articles in the second quarter of FY 2021. Bench testing and radio control systems were certified in the third quarter of FY 2021. Field/Operational testing delayed due to range availability in the fourth quarter of FY 2021 but rescheduled for the first quarter of FY 2022. Second delivery of updated test articles (new												

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603133D8Z / <i>Foreign Comparative Testing</i>	Project (Number/Name) 313 / <i>Foreign Comparative Testing</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
units provided by vendor) will be accepted in the second quarter of FY 2022. Project continues with FY 2021 funds and results presented to the decision maker in the third quarter of FY 2022 for future program of record integration. Project will complete with final close out report in the FY 2022 fourth quarter.			
Title: Anti-Submarine Warfare Sensor Capabilities for Unmanned Surface Vehicles (Navy) Description: This project tests a compact towed variable depth sonar system for Navy Unmanned Surface Vehicles (USVs). This project enhances DoD capabilities in the Autonomous Systems focus area by providing autonomous sensor launch, recovery, and operation suitable for USVs. If successful, this technology transitions to the Navy's Unmanned Maritime Systems Program Office for follow on acquisition and fielding. Test planning and contract preparation occurred in the fourth quarter FY 2019. Test articles were received in the third quarter of FY 2020. Acceptance testing occurred in the fourth quarter of FY 2020. Additional funding was provided in the third quarter of FY 2021 for operational demonstration during Service exercises for decision makers. Expect to complete with close out report in the third quarter of FY 2022 with FY 2021 funds.		0.300	-
Title: Hostile Fire & Pre-Shot Detection for Vehicle Protection Systems (Army) Description: This project comparatively tests technologies to autonomously detect and locate incoming hostile fire as well as potential threats before a shot is fired. These technologies will increase situational awareness and reduce response times leading to increased lethality and survivability for ground forces, especially in urban environments. This project enhances DoD capabilities in the Autonomous Systems focus area. If successful, this technology will transition to the Army's Program Manager for Vehicle Protection Systems for initial fielding in 2023. Test articles received and initial testing, bench testing and safety certification occurred throughout FY 2020, including task plan update and coordination with allied nation. Review and decision expected by the third quarter of FY 2021 was delayed by COVID-19. Expect to complete integration for full operational testing with new system in the second quarter of FY 2022. Expect to close with final test report in the fourth quarter FY 2022 with FY 2021 funds.		0.750	-
Title: Dual Protocol Network Interface Card (Air Force) Description: This project evaluates a network interface card that supports both low-speed legacy Military Standard 1553B and high-speed North Atlantic Treaty Organization (NATO) Standardization Agreement (STANAG) 7221 protocols. This provides an affordable upgrade path to high-speed 100 Mbps data throughput for aircraft networks enabling weapons systems to perform at desired warfighting capability levels. This project enhances DoD capabilities in the FNC3 focus area. If successful, this technology will transition to the Air Force Program Executive Office Fighter/Bombers for follow-on procurement and fielding on military aircraft. Initial test planning and contract preparation occurred in FY 2019. Test article received in the second quarter of FY 2020. Laboratory testing occurred in the third quarter of FY 2020. Other testing completed in the fourth quarter of FY 2021. This project will close with final test report in the first quarter of FY 2022 with FY 2021 funds.		0.034	-

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603133D8Z / <i>Foreign Comparative Test ing</i>		Project (Number/Name) 313 / <i>Foreign Comparative Testing</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Title: Mine Clearance Line Charge Replacement (Navy) Description: This project comparatively tests the performance and reliability of modern mine clearing technologies against the legacy MK-154 Mine Clearing Line Charge (MICLIC). The MICLIC, which is 1950's era technology has a history of reliability, safety, and availability issues. If successful, this technology will transition to the U.S. Marine Corps' Portfolio Manager for Logistics Combat Element Systems to replace/supplement existing MK-154 Mine Clearing Line Charges (MICLICs). Contract preparation occurred in 2Q FY 2020. Contract was awarded in the fourth quarter of FY 2020. The product was delivered to the test site in the fourth quarter of FY 2021 for testing in the first quarter of FY 2022. This project will close out with final test report in the first quarter of FY 2022 using FY 2021 funds.			0.587	-	-
Title: Turreted Mortar System (Army) Description: This project will test a turreted mortar system to fill capability gaps within the Brigade Combat Team and across the Multi-Domain Battlefield concept. The system will increase lethality and survivability through extended range, low angle, 360-degree delivery capability, and fire on the move capabilities with overhead protection. If successful, this technology will transition to the Army's Armored Multi-Purpose Vehicle Program Office in FY 2022. Contract preparation and award occurred in FY 2020. System received and initial testing complete in the second quarter of FY 2021. System completed operational testing in the fourth quarter of FY 2021. This project will close out and transition decision made in the third quarter of FY 2022 with FY 2021 funds.			0.577	-	-
Title: Lightweight Short-Range Guided Missiles (USSOCOM) Description: This project comparatively tests man-portable, shoulder-fired missile systems that utilize seeker technology for engaging moving or static targets at extended ranges compared to existing unguided weapons systems within the USSOCOM inventory. If successful, this technology will transition to USSOCOM's Program Executive Office, Special Operations Forces Warrior for follow-on procurement. Test article contract award and test planning occurred in the fourth quarter FY 2020. In FY 2021, the completion of live-fire testing, warhead characterization and final test shots occurred. This test series evaluation and analysis will characterize the ability of foreign systems to both safely and effectively engage targets. Evaluation of the lethality compared to the FGM-148 Javelin completed in the fourth quarter of FY 2021. FY 2022 Plans: This project continues in FY 2022 with a joint determination on the metrics that will define a successful transition capability for the system. This will also include the evaluation and characterization of foreign designs, warhead and propulsion systems, and seeker and tracking algorithms. The effort will culminate with live-fire flight testing of relevant systems to determine whether the system capabilities warrant transition to the Army Individual Assault Munitions Program of Record in the third quarter of FY 2022. FY 2022 to FY 2023 Increase/Decrease Statement:			0.550	0.250	-

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603133D8Z / <i>Foreign Comparative Test ing</i>	Project (Number/Name) 313 / <i>Foreign Comparative Testing</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
Funding decreases from FY 2022 to FY 2023 as final testing completes and project close out.			FY 2023
Title: Advanced Closed Cycle Hull Cleaning (Navy) Description: This project comparatively tests robotic systems that capture and treat marine biofouling collected during underwater hull cleaning operations. This will improve the DoD's global environmental compliance posture and increase operational readiness as existing methods of hull cleaning do not comply with new environmental regulations, particularly on the west coast of the United States due to the creation of biofouling. If successful, the Naval Sea Systems Command's Salvage and Diving office will transition the technology through updating contractor hull-cleaning requirements. Contract preparation and test planning took place in the fourth quarter of FY 2020. Contracts awarded and the first field testing with systems and vessels completed in FY 2021. FY 2022 Plans: Water sampling analysis will take place in 1Q FY 2022. The second round of field testing will occur in 3Q FY 2022. Test report will be completed and project close out in 4Q FY 2022. FY 2022 to FY 2023 Increase/Decrease Statement: Funding decreases from FY 2022 to FY 2023 as support to major test events ends and technology transitions to the Navy.		0.504	0.509
			-
Title: Software Defined Acoustic Modem Evaluation (Navy) Description: This project comparatively tests commercial software-defined radios in underwater acoustic environments. This technology enables interoperable, reliable, and secure communication between surface and subsurface platforms and sensors. If successful, this technology will transition to Naval Undersea Warfare Center, Newport Division, for inclusion in follow-on large-scale prototype undersea network demonstration programs and additional evaluation. Contract preparation and test planning occurred in the fourth quarter of FY 2020. Product acceptance and characterization testing occurred in the second quarter of FY 2021. Planning and integration for operational evaluation occurred in the fourth quarter of FY 2021. FY 2022 Plans: Controlled in-water testing planned for the first quarter of FY 2022. Final demonstration event will occur in the third quarter of FY 2022. Project will close out and test report completed by the fourth quarter of FY 2022. FY 2022 to FY 2023 Increase/Decrease Statement: Funding decreases from FY 2022 to FY 2023 as final testing is complete and project is closed out.		0.553	0.482
			-
Title: Semi-Autonomous Devices for Medical Care (Army) Description: This project evaluates interoperable medical devices such as ventilators and IV pumps that are remotely controlled. This could result in improving the quality and safety of patient care by enabling immediate adjustment of device settings		0.870	0.630
			-

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603133D8Z / <i>Foreign Comparative Test</i> <i>ing</i>		Project (Number/Name) 313 / <i>Foreign Comparative Testing</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
immediately. Planning and contract development completed in FY 2021. Contract award and product delivery planned in the first quarter FY 2022.					
FY 2022 Plans: Phase two interoperability testing will complete in the third quarter of FY 2022. The Program Manager will make a transition decision and submit a close out report in the fourth quarter of FY 2022.					
FY 2022 to FY 2023 Increase/Decrease Statement: Funding decreases from FY 2022 to FY 2023 as final testing completes and project is closed out.					
Title: Top Attack Armor (Army)			0.400	1.100	-
Description: This project comparatively tests improved vehicle protection technology for defeating overhead threats to Armored Fighting Vehicles. This provides protection against modern anti-tank threats while minimizing negative mobility impact.					
FY 2022 Plans: Phase two field testing will occur in the second quarter of FY 2022. Project will close out and test report completed as well as go or no-go procurement decision by the fourth quarter of FY 2022.					
FY 2022 to FY 2023 Increase/Decrease Statement: Funding decreases from FY 2022 to FY 2023 as test events are completed					
Title: Airborne Threat Discrimination Sensors (Navy)			1.050	0.250	-
Description: This project comparatively tests wide-field-of-view electro-optic and infrared sensors for land and ship platforms as a complement to radar. This enables passive detection and tracking of challenging airborne threats.					
FY 2022 Plans: Phase one collection of field data will take place in the first quarter of FY 2022. Phase two collection will take place in the third quarter of FY 2022. The Program Manager will make a transition decision and complete a close out report in the fourth quarter of FY 2022.					
FY 2022 to FY 2023 Increase/Decrease Statement: Funding decreases from FY 2022 to FY 2023 as test events are completed.					
Title: 1000V DC Power Systems for Directed Energy (Navy)			0.616	0.755	-

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603133D8Z / Foreign Comparative Test ing	Project (Number/Name) 313 / Foreign Comparative Testing			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>Description: This project evaluates an off-the-shelf large-scale energy storage system designed for maritime use. This supports development of next generation directed-energy weapon systems for naval platforms. If this comparative test is successful, Program Executive Office (PEO), Electric Ships will then add this to a Program of Record (PoR).</p> <p>FY 2022 Plans: Phase one of the comparative test will complete in the second quarter of FY 2022. Phase two of the comparative test will complete in the third quarter of FY 2022.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding decreases from FY 2022 to FY 2023 as project closes out. Project will close out and test report will be completed by the fourth quarter of FY 2022.</p>					
<p>Title: Cold Weather All-Terrain Vehicle (Army)</p> <p>Description: This project comparatively tests off-the-shelf cold weather capable tracked vehicles with enhanced off-road mobility. This accelerates the fielding of a replacement for an obsolete system and enables logistics support in austere conditions. If successful, this technology will transition to Cold Region Test Center (CRTC), Alaska for further testing.</p> <p>FY 2022 Plans: Production contract award expected to be completed the third quarter of FY 2022. First article test and production test complete in the third quarter of FY 2022. Final test report, procurement decision, and project close out to occur in the fourth quarter of FY 2022.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding decreases in FY 2023 as evaluation completes and procurement of down-selected vehicle occurs.</p>			0.500	0.500	-
<p>Title: Future Aviation Ground Power Unit (Army)</p> <p>Description: This project evaluates a modern, off-the-shelf aviation support system for military rotary wing aircraft. It improves aviation maintenance efficiency and reduces aircraft downtime. If successful, FCT will support the ongoing assessment and down-select of vendors to support the transition to a program of record (PoR).</p> <p>FY 2022 Plans: Testing expected to begin the second quarter of FY 2022. Final test report, procurement decision, and project close out to occur in the fourth quarter of FY 2022.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>			0.500	1.260	-

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603133D8Z / <i>Foreign Comparative Testing</i>	Project (Number/Name) 313 / <i>Foreign Comparative Testing</i>		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Funding decreases in FY 2023 as support to major test events ends and full procurement initiates.					
Title: Precision Strike Missile Sub-munitions (Army) Description: Comparatively tests sensor-fuzed sub-munitions for the Army's next generation, long-range precision strike missile. Provides increased lethality against armored targets while maintaining treaty compliance. If successful, technology will have a signed transition agreement with Program Executive Office (PEO) Missiles & Space for insertion into the Precision Strike Missile Program. FY 2022 Plans: Precision Strike Missile Sub-munitions (Army): Test item procurement in the first quarter of FY 2022. Testing to occur sometime between the second and third quarter of FY 2022. Final test report, procurement decision, and project close out will occur in the fourth quarter of FY 2022. FY 2022 to FY 2023 Increase/Decrease Statement: Funding decreases in FY 2023 as project is complete and closed out.			0.754	0.700	-
Title: National Advanced Surface-to-Air Missile System (NASAMS) (Air Force) Description: Integrate the NASAMS fire distribution center (FDC) with existing Integrated Air and Missile Defense Battle Command System / Command and Control (IAMD/C2) architecture currently deployed at a Combatant Command's forward operating base. The Services have a mid-tier engagement operational gap (cruise missile and group 3-5 Unmanned Aerial Vehicles) they are planning to fill with an interim solution, followed by the enduring solution but maturity is not expected until beyond 2025. This evaluation will provide data to those decision makers. Planned evaluation is to conduct various simulated threat events drills to assess operational performance of warfighter and system. It will leverage an Air Force experiment to assess operational utility of NASAM's Mark 11 guided missile launching system (GMLS) launcher in a system of systems with sensors and Command and Control (C2). It will also validate critical assumptions and performance metrics used in defense of the airspace around a base. This evaluation will provide critical data for the design of the comprehensive IAMD solution for troops at a forward location or any base. Contracts do not include live fire or system redeployment unless additional contract awarded. FY 2022 Plans: In the second quarter of FY 2022, multiple evaluations of the system will occur in real time with previously trained warfighters. In the third quarter of FY 2022, they will display the capability of the NASAMS for decision makers at the Combatant Command level. Data from the capability display will be used for a technical evaluation to the U.S. Air Force and U.S. Army decision maker's future procurement decisions. Final test report, procurement decision, and project close out is expected in the fourth quarter of FY 2022. FY 2022 to FY 2023 Increase/Decrease Statement:			0.400	2.400	-

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603133D8Z / <i>Foreign Comparative Test ing</i>	Project (Number/Name) 313 / <i>Foreign Comparative Testing</i>		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Funding decreases in FY 2023 to support project completion and close out.					
Title: Visual Detection and Ranging (ViDAR) – Autonomous Wide-Area Surveillance Sensor on Small Unmanned Aerial System (UAS) (Navy) Description: This FCT project will test an Infrared ViDAR sensor on small Group 1 UAS optimized for Maritime Wide-Area Surveillance in support of Naval and Marine Forces in the Littoral Battlespace. This is an evaluation of an optical radar that can autonomously detect small objects on the sea surface over very wide areas, by day and night, in conditions up to Sea State 6. Following successful test and evaluation, ViDAR on Small UAS operating certifications and procurements will be managed directly by PMA-263 for Small UAS and Payloads Programs of Record. FY 2022 Plans: Planning and contract award expected in the first quarter of FY 2022. Acceptance and characterization of systems and bench test will occur between the second and third quarter of FY 2022. Limited operational evaluation will occur in the fourth quarter of FY 2022, to include multiple field tests of the prototype in an operational relevant environment. FY 2023 Plans: Testing of the functionality of ViDAR on a UAS during operational experiments is planned in the second quarter of FY 2023. FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.			0.150	1.175	0.175
Title: Sappheiros-3D Persistent Surveillance System (Army) Description: Comparatively tests Expendable Unattended Ground Sensor (E-UGS), a single-sensing modality, point-to-point communication system for perimeter surveillance, as well as the Engineer Research and Development Center's Linear Sensor System (LSS) for subterranean (SubT) sensing. The LSS requires buried installation and does not readily support temporary or expeditionary Force Protection. This test will compare and contrast the Sappheiros 3D performance to currently fielded E-UGS and LSS. FY 2022 Plans: Evaluation will include multiple field tests of the prototype Sappheiros-3D sensor system in an operational relevant environment, first demonstration in the third quarter of FY 2022, and second demonstration at the Army Experimental Warfighter Exercise in the fourth quarter of FY 2023, as well as feedback from Army soldiers. FY 2023 Plans:			0.050	0.500	0.600

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603133D8Z / <i>Foreign Comparative Test ing</i>	Project (Number/Name) 313 / <i>Foreign Comparative Testing</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>Test functionality of Android Tactical Assault Kit (ATAK) interface to ensure compatibility with latest release of ATAK. In the second quarter of FY 2023, data will be submitted to the Army Test and Evaluation Command for validation on the Sappheiros-3D system. In the third quarter of FY 2023, a cost-benefit analysis will be performed to inform acquisition decisions.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding increases in FY 2023 to support final evaluations, project completion, and close out.</p>			
<p>Title: Low-Cost Innovative Projects (Projects Less Than One Million Dollars Each):</p> <p>Description: The Under Secretary of Defense for Research and Engineering (OUSD R&E) Mission Prototypes (MP) Office, selects multiple low-cost projects in the areas of Force Application, Force Protection, Force Support, Logistics, Artificial Intelligence and Machine Learning, Robotics and Autonomous Systems, Interoperability, and Countering Unmanned Systems. These projects were selected to deliver prototypes for evaluation, assessment, and Service adoption within 12 to 36 months.</p> <p>FY 2021 Projects:</p> <p>-Bacteriophage (Army): Lack of urination and dehydration are primary drivers of Urinary Tract Infection (UTI) cases, decreasing readiness of the force specifically the female population. Mitigation strategies include training to avoid dehydration, issuance of Female Urinary Device to allow ease of urination in austere/deployed settings or broad-spectrum antibiotics for UTI treatment, which come with unwanted urogenital side effects. This evaluation tests if phage treated wipes will selectively target the bacteria causing UTIs without unwanted health effects seen with antibiotics. This project will be initiated in the fourth quarter of FY 2021. Test planning and contract awards are scheduled for the second quarter of FY 2022. Bench testing with standard lab protocols to evaluate commercially available phage mixture for effectiveness against the pathogenic bacteria will occur between the second and third quarter of FY 2022. Effectiveness evaluation of phage mixture in a wipe by lab tests will take place in the first quarter of FY 2023, and based on results, will determine the next steps. The project ends with decision maker's movement to a human study/field trial.</p> <p>-Civil Affairs Solution-Army Analytics (USSOCOM): This project tests intelligence software that fuses imagery from Unmanned Aerial Systems and satellites with other sensor data and uses Artificial Intelligence and Machine Learning (AI/ML) to rapidly provide actionable analytics. This technology supports Department of Defense Civil Affairs operations by analyzing population migration caused by conflict or natural disasters to enable dynamic planning for large scale operations. This project enhances the DoD capabilities in the AI/ML focus area. If successful, this technology will be available for transition to the Army's Distributed Common Ground System Program of Record. Test planning occurred in the fourth quarter of FY 2019. Test article contract award completed in the third quarter of FY 2020. Operational testing starts in the fourth quarter of FY 2021, using FY 2021 funding, and completes in the third quarter of FY 2022.</p>		13.355	7.290
			1.020

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603133D8Z / <i>Foreign Comparative Test ing</i>	Project (Number/Name) 313 / <i>Foreign Comparative Testing</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>-Event-Based Sensing for Moving Target Indication (MTI) (Air Force): The project tests MTI algorithms in the lab for platform feasibility and assess critical sensor performance characteristics to transition prototypes to field simulators and representative environmental tests. Event-Based Sensing has potential for inherently faster cueing with faster detection, less processing, at a lower cost. Potential DoD applications include MTI, air base air defense, missile warning, and etc. This project initiated in the fourth quarter of FY 2021. Test planning and contract award is expected in the second quarter of FY 2022.</p> <p>-Explosive Blast Overpressure Sensor Comparison (Army): This project compares two commercially available explosive blast sensors from foreign vendors, with the U.S.A.-made Black Box Biometrics Blast Gauge System. These systems measure explosive blast overpressure experienced by warfighters from improvised explosive devices, ordnance, and weaponry. These measurements are necessary to maintain joint lethality and optimize long-term brain health. The 2020 National Defense Authorization Act (NDAA), Section 716, directs the DoD to include “career blast exposure history” in medical records of members of the Armed Forces. If successful, this technology will transition to the Army Medical Command to meet the NDAA directive. Contract award occurred in the third quarter of FY 2021. Testing will be completed in the fourth quarter of FY 2021. The project will continue into FY 2022 with FY 2021 funds. This project will conclude in the first quarter of FY 2022 with the close out report expected in the second quarter of FY 2022.</p> <p>-Insensitive Munitions Fuse for the M67 Fragmentation Hand Grenade (Army): Comparatively tests off-the-shelf hand grenade fuses to provide increased safety to the operator while maintaining lethality for the widely used M67 fragmentation hand grenade. The M67 has been in use since the 1960s and does not meet current Insensitive Munitions safety standards. If successful, this technology will transition to the Army’s Program Executive Office for Ammunition for follow on acquisition. Test article delivery and initial safety testing occurred in the fourth quarter of FY 2019 through the third quarter of FY 2020. Final testing and close out report completed in the second quarter of FY 2021.</p> <p>-Panoramic Infrared Sensor Test (Navy): Comparatively tests foreign naval panoramic infrared sensors with autonomous detection capabilities to enhance shipboard detection and tracking of both surface and air targets to include low, slow, and small Unmanned Aerial Systems. If successful, this technology will transition to the Navy’s Program Executive Office for Integrated Warfare Systems for insertion into the future Guided Missile Frigate and Supercarrier I-Stalker programs. Test articles received and acceptance testing occurred in FY 2019. Shipboard testing of the sensor was scheduled for the second quarter of FY 2020, but this was delayed due to COVID-19. Transition decision and close out report completed in FY 2021.</p> <p>-Autonomous Aircraft Material Maintenance (Navy): This project tests a trailer-mounted, autonomous cold spray metallization technology for in-situ repair of corrosion damaged areas on aircraft. If successful, the technology will be available for follow-on</p>			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
procurement and fielding by the Navy's Fleet Readiness Centers. The project completed several demonstration events in FY 2020 for the military aviation community. Transition decision and close out report completed in FY 2021.			
-Night Vision Device Capable Deck Status Display (Navy): This project evaluates a deck status display currently in use with over ten countries that provides landing status to pilots through night vision compatible symbology, instead of colors, enabling safer night landing operations. If successful, this project will transition to the Navy's Aircraft Launch and Recovery Equipment Program of Record. Test articles underwent acceptance testing in 4Q FY 2019. Performance evaluation occurred in FY 2020. Final testing completed in 2Q FY 2021 with FY 2020 funds. Transition decision and close out report completed in FY 2021.			
-Reserve Battery for Munitions (Army): This project comparatively tests foreign off-the-shelf reserve battery solutions for use with medium-caliber mortar and artillery applications, to enhance the industrial base. If successful, the Army's Armaments Research Development and Engineering Center will pursue acquisition through either direct purchase from a foreign source or licensed production by a U.S. company. This project completed laboratory testing in 2Q FY 2019, initiated live fire testing in 1Q FY 2020, and completed bench testing in 2Q FY 2020. This project completed in FY 2021.			
-Individual Assault Munition (Army): This project tests a new warhead for existing shoulder-fired weapon systems, to increase lethality by enabling fire from enclosures and by enabling engagement of structures and light armored targets. Performance verification testing occurred in FY 2019. Acceptance and firing tests completed in 3Q FY 2020. An airdrop test occurred in 2Q FY 2021. This project completed in 4Q FY 2021.			
-Low-Cost Autonomous Target Classification (L-CATC) (Navy): This project conducts at-sea testing of underwater passive acoustic sensors and associated processing software. This technology provides an increased probability of detection and classification for both surface and submerged vessels. A test article engineering change for the underwater acoustic sensor was initiated in FY 2019. The final test evaluation of the sensor was scheduled for 4Q FY 2020, but that was delayed until 1Q FY 2021 due to COVID-19. A close out report completed in 1Q FY 2021.			
-105 Millimeter Family of Multi-Purpose Munitions (Army): This project tests two variants of a multi-purpose 105 millimeter(MM) munition including high explosive and anti-personnel/anti-material for increased lethality, safety, and reliability. If successful, the technology will be available for transition to the Army's Mobile Protected Firepower vehicle program. The test article contract was awarded in FY 2019 with the test articles being delivered in 4Q FY 2020. This project completed FY 2021.			
-Uncooled 120 Hertz Longwave Infrared Focal Plane Arrays for Night Vision Sensors (Army): This project comparatively tests foreign-developed focal plane array technology for next generation night vision devices. Recent advancements in optical technology offer increased resolution and refresh rates for night vision applications, which enable enhanced situational			

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B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
awareness. If successful, this technology will be available for transition to the Army's Project Manager for Soldier Sensors and Lasers for insertion into programs of record. Test article acquisition and integration occurred in FY 2020. This project completed in FY 2021.					
-Modular Airdrop Platform (Army): This project tests an innovative airdrop platform system with underside airbags that eliminates the need for energy dissipating material. The technology will increase lethality and readiness by enabling a rapid roll-on/off capability and will significantly reduce logistics costs. If successful, this technology will be available for transition to the Product Manager, Force Sustainment Systems - Cargo Air Delivery for insertion into the Advanced Low Velocity Airdrop System Program of Record. Ground testing was completed 3Q FY 2019. Platform and static drop tests were completed in 1Q FY 2020. Air drop testing completed in FY 2021.					
-Magnetic Signature Duplicator System (Army): This project evaluates the performance of a foreign magnetic signature duplicator and against known landmine threats. If successful, the technology will be available for transition to the Army's Mounted Detection System Program of Record for follow- on acquisition. Test planning and contract award occurred in FY 2019. The test article was received in 2Q FY 2020. This project completed in FY 2021.					
-Nanostructured Graphene Composites for Microwave Attenuation (Army): This project evaluates the performance of graphene composites that allow for integration into the exterior compound of any munition, unmanned aerial vehicle or manned platform. The deliverable is a report detailing material property results and recommendations on the suitability of the material for implementation in radio frequency solutions for munitions falling under the Long Range Precision Fires. The intent of the project is to determine if the new amalgamated exterior provides beneficial characteristics. This project was initiated out-of-cycle in 4Q FY 2021. Initial test planning and contract preparation is expected in 1Q FY 2022. Operational testing is scheduled for 4Q FY 2022 with operational evaluations in 1Q FY 2023. Additional tests to evaluate mechanical and thermal properties will occur in 2Q – 3Q FY 2023.					
-Personal Dosimeter as an Emergency Response System (Army): This project tests foreign Dosimeter technology along with an automated field analytics system for rapid identification and triage of individuals exposed to radiological or nuclear substances. This technology will be evaluated alongside the current Joint Personal Dosimeter, to determine capabilities in an operational environment. If successful, this technology will transition to the Joint Program Manger Guardian Program of Record. This project was initiated out-of-cycle in 4Q FY 2019. Initial test planning and contract preparation occurred in 4Q FY 2019. Operational testing scheduled for 4Q FY 2020 was delayed due to COVID-19. This project continued in FY 2021 and into FY 2022.					
-Artificial Intelligence (AI) Neuromorphic Chip (Army): This project evaluates a low-cost neuromorphic chip to replace the current paper and pencils method for counting 120-millimeter mortar rounds, to more accurately determine weapon system life cycle					

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B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>maintenance. This effort demonstrates a tactical application of AI, will increase readiness, and could save millions of dollars in maintenance cost. If successful, this technology will be available for transition to the Army's Stryker Program Office for acquisition. This project was initiated out-of-cycle in 4Q FY 2019. Initial test planning and contract preparation occurred in 4Q FY 2019. The test article was received in 1Q FY 2020. Acceptance tests were completed in 2Q FY 2020. Operational testing with a live-fire evaluation will occur in 2Q FY 2022 with a closeout report produced upon project completion in 3Q FY 2022.</p> <p>-Vector Engine Processor for Use with Legacy Hypersonic Codes (Navy): This project evaluates a high-performance vector processor to significantly reduce time required to evaluate hypersonic designs. If successful, the technology will transition to the High-Performance Computing Modernization Program. Initial test planning and contract preparation occurred in FY 2019. Test articles were received in 2Q FY 2020. Evaluation with legacy hypersonic codes began in 3Q FY 2020. This project continues in FY 2021.</p> <p>-High Powered Microwave (HPM) Electro-Optic Electromagnetic Field Sensors (Air Force): This project tests various foreign electro-optic electromagnetic field sensors for use at Department of Defense test ranges to enhance directed-energy research, development, test and evaluation efforts. Current radio frequency antennas are too large to embed within HPM targets and thus, are unable to accurately measure HPM effects. If successful, the technology will transition to the Air Force Research Laboratory for follow on procurement as a test asset in support of future HPM test and evaluation efforts. This project was initiated out-of-cycle in 4Q FY 2019. Initial test planning and contract preparation occurred in 4Q FY 2019. Test articles received in FY 2020. Test and evaluation continues in FY 2022 with FY 2021 funds.</p> <p>-Enhancing DoD Infrastructure Repair (Army): This project evaluates a rapid-setting polymer-based mortar for repair of damaged airfield runways and critical infrastructure. This will increase readiness and significantly reduce shipping costs by providing a qualified material source, in theater, that meets performance requirements. If successful, the Army's Engineering Research & Development Center will include this product as an approved rapid airfield damage repair capping material. Contract preparation and test planning was initiated in 4Q FY 2020. Test and evaluation continues in FY 2022 with FY 2021 funds.</p> <p>-Rapid Response Fentanyl Test Strips (Army): This project evaluates the efficacy of commercially available rapid immunoassay test strips to detect the presence of fentanyl and its analogs. This provides an easy to use, small, low-cost detection method that does not require powerful chemicals. If successful, the Joint Program Executive Office for Chemical Biological Defense will transition this technology into Reactive-Chemistry Orthogonal Surface and Environmental Threat Ticket Array (ROSETTA) Program of Record. Contract preparation and test planning occurred in 4Q FY 2020. In FY 2021 bench testing and initial chamber testing of chemical reactions occurred. The operational testing of the strips is awaiting range availability in 2Q FY 2022. See FY 2022 Plans section for subsequent project activities.</p>					

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B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>-Extended Reality (XR) Helmet Mounted Display (Navy): This project comparatively tests emerging XR technologies for T-6B operational flight trainers. This will increase training effectiveness while significantly reducing costs and footprint versus legacy flight-training systems. If successful, this technology will transition to the Naval Aviation Training Systems and Ranges Program Office for follow on acquisition. Contract preparation and test planning occurred in 4Q FY 2020. Test articles received in FY 2021. See FY 2022 Plans section for subsequent project activities.</p> <p>-Space Qualification Testing of Event-Based Sensors (Air Force): This project comparatively tests neuromorphic imaging sensor technology under simulated space conditions. This technology offers advantages in performance, size, weight, power, and signal processing that are suitable for space-based applications. If successful, this technology will transition to follow-on high altitude testing. Contract preparation completed in 4Q FY 2020. Testing and transition completed in FY 2021. See FY 2022 Plans section for subsequent project activities.</p> <p>-Precision Vertical Take-off Unmanned Aerial System (VTUAS) (Navy): This project evaluates an ultrasound navigation aid to autonomously guide the landing of VTUAS on moving platforms in all weather conditions. This increases survivability by reducing operator exposure to threats while conducting VTUAS recovery. If successful, this will transition to Navy and Marine Corps Small Tactical Unmanned Aircraft Systems Program Office. The test article contract was awarded in 3Q FY 2020 and the test articles were received in 4Q FY 2020. Test and evaluation at bench level occurred in 3Q FY 2021. See FY 2022 Plans section for subsequent project activities.</p> <p>-Accelerating Human Performance Discovery (Army): This project evaluates an advanced fluorescence microscope with live-cell imaging and analysis against existing capabilities. This technology greatly reduces analysis time from weeks to hours of live-cell imaging and streamlines the development of human performance optimization products. If successful, this technology will transition to the Army's Combat Feeding Directorate and other Service laboratories for continued human performance research & development activity. The contract was awarded and test articles received in 4Q FY 2020. Multiple case use scenarios ran in FY 2021 and analysis of results reviewed 4Q FY 2021. Project is expected to close in 2Q FY 2022.</p> <p>-Counter-Unmanned Aircraft Systems (C-UAS) for Vehicle Protection Systems (Army): This project evaluates an autonomous system that combines passive UAS detect, locate, identify and intercept for potential application to ground combat vehicles. This technology eliminates the need to integrate separate C-UAS detect and defeat systems. If successful, this technology will transition to the Army's Product Manager for Vehicle Protection Systems for follow-on acquisition. Contract preparation and test planning occurred in 4Q FY 2020. Articles received and mounted on vehicles for operational testing 3Q FY 2021. Range testing continues in 2Q FY 2022. See FY 2022 Plans section for subsequent project activities.</p>					

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>-High Power Phased Array Radar (HPAR) (Air Force): This project demonstrates an expeditionary S-band active electronically steered array radar with digital beamforming. This technology provides long range surveillance, detection, and tracking of aerial targets in complex electromagnetic and operational environments. This project enhances DoD capabilities in the Air and Missile Defense focus area. If successful, this technology will transition to the Air Force's Three-Dimensional Expeditionary Long Range Radar Program of Record. Contract preparation and test planning occurred in 4Q FY 2020. Comparative demonstration occurred in 1Q FY 2021.</p> <p>-Nano-Clay Seals for Long Service Life (Air Force): This project evaluates the service life of emerging nano-clay enhanced compression O-ring seal materials against existing nitrile rubber. This technology significantly reduces aircraft engine life cycle costs. If successful, the Air Force Research Laboratory will modify current military specifications and the technology will be available for purchase through the Defense Logistics Agency. Contract awarded in 3Q FY 2020. Acceptance occurred in 2Q FY 2021. Operational test of seals occurred from 3Q FY 2021 until 1Q FY 2022. Analysis of data and presentation to decision makers expected 2Q FY 2022.</p> <p>-Accurate Tracking & Unmanned Underwater Vehicle Navigation (Navy): This project tests sensors that enable accurate real-time tracking of unmanned underwater systems without the need for high-cost Inertial Navigation Systems. If successful, this technology will be available for transition to Navy Unmanned Underwater Vehicle (UUV) and Remotely Operated Vehicles programs of record. The operational demonstration occurred in 2Q FY 2021. Transition decision and a close out report completed by 4Q FY 2021.</p> <p>-Comparative Real-Time Air Quality Sensing (Air Force): Phase 1 Initial standard unit test to be completed 3Q FY21. Phase 2 Mock flight tests of standard unit test to be completed 4Q FY 2021. Phase 4 testing to be completed in 2Q FY 2022. Phase 5 testing to be completed in 3Q FY 2022. Technology demonstration to occur in 4Q FY 2022. A procurement decision will be made and a close out report will be submitted in 4Q FY 2022.</p> <p>-Non-kinetic Defeat of Small Unmanned Aerial Systems (Army): Evaluates a non-kinetic counter-unmanned aerial system for vehicles and fixed site configurations to increase probability of defeat while reducing collateral damage. Funds placed on contract for the purchase of test articles, Cueing sensor integration begins 1Q FY 2022.</p> <p>-Vehicle Mounted Camouflage (Army): Comparative testing vehicles coverings that reduce detection across multiple spectrum bands including infrared, microwave, and radar to increase survivability in contested environments. FY 2021 test plan development, material specification reviews. FY 2022 Plans: Lab validation of vendor claims utilizing environmental and material testing Field testing of the camouflage will take place in 1Q FY 2022. Test report and procurement decision will be made in 2Q FY 2022.</p>			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>-Water Free Chemical Decontaminant System (Army): Comparatively test efficacy of water free decontaminant, GD-6 for residual agent contamination and contact transfer hazard effectiveness. This would increase survivability in contested environments. FY 2021 contracting for acquisition of test articles and test planning. FY 2022 Limited efficacy testing and equipment compatibility testing of the decontaminant agent will take place between 1Q FY 2022 and continues until 3Q FY 2022. Test report will be completed by 4Q FY 2022, which will be used by the Program of Record to support follow-on demonstrations and a procurement decision.</p> <p>-Water/Land Initiated Sensing Aerial Disconnect (USSOCOM): Evaluates an airdrop system enhancement that automatically disconnects restraints once it has reached its destination. This enables fully autonomous delivery and derigging of unmanned systems and vehicles. FY 2021 acquisition of test articles bench testing and airdrop safety certification. User evaluation will take place in 1Q FY 2022. Project will close out and evaluation report completed in 2Q FY 2022.</p> <p>-Active Protection Systems for Light Armored Vehicles (Navy/USMC): FY 2021 acquisition of test articles. FY 2022: Live fire testing will take place in 1Q FY 2022. Project will close out and procurement decision made by Program Executive Office (PEO) Land Systems in 3Q FY 2022.</p> <p>-Organic Precision Fires – Infantry, Light (Navy/USMC): FY 2021 test article acquisition. FY 2022: Phase one flight testing will take place in 1Q FY 2022 with a down select to one vendor. Phase two evaluation testing will take place in 2Q FY 2022. Project will complete and procurement decision made by the program manager to be included in the Aerial Loitering Munitions program in 2Q FY 2022.</p> <p>-Portable High Power Directed-Energy Systems for Aviation Support (Navy): FY 2021 Test article acquisition. FY 2022: Phase one validation testing will complete in 2Q FY 2022. Field trials will take place in 3Q-4Q FY 2022. Project will complete and, if successful, this technology will be added to the Authorized Equipment Lists for Naval and Marine squadrons in 4Q FY 2022.</p> <p>FY 2022 Plans: Description: The Under Secretary of Defense for Research and Engineering (OUSD R&E) Mission Prototypes (MP) Office, selects multiple low-cost projects in the areas of Force Application, Force Protection, Force Support, Logistics, Artificial Intelligence and Machine Learning, Robotics and Autonomous Systems, Interoperability, and Countering Unmanned Systems. These projects were selected to deliver prototypes for evaluation, assessment, and Service adoption within 12 to 36 months.</p> <p>FY 2022 Projects:</p>			

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B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>-Bacteriophage (Army): Test planning and contract awards in the second quarter of FY 2022. Bench testing with standard lab protocols to evaluate commercially available phage mixture for effectiveness against the pathogenic bacteria will occur in the third and fourth quarter of FY 2022. Effectiveness evaluation of phage mixture in a wipe by lab tests will take place in the first quarter of FY 2023. A go/no-go decision expected in the second quarter of FY 2023. The project ends with decision maker's movement to a human study/field trial.</p> <p>-Event-Based Sensing for Moving Target Indication (MTI) (Air Force): This project initiated in the fourth quarter of FY 2021. Test planning and contract award in the second quarter of FY 2022. Bench testing and acceptance in the fourth quarter of FY 2022. Project continues in FY 2023.</p> <p>-Explosive Blast Overpressure Sensor Comparison (Army): The project will conclude in the first quarter of FY 2022 with the close out report expected in the second quarter of FY 2022.</p> <p>-Nanostructured Graphene Composites for Microwave Attenuation (Army): Initial test planning and contract preparation in the first quarter of FY 2022. Operational testing to occur in the fourth quarter of FY 2022 with operational evaluations in the first quarter of FY 2023. Additional tests to evaluate mechanical and thermal properties will occur between the second and third quarter of FY 2023.</p> <p>-Artificial Intelligence (AI) Neuromorphic Chip (Army): Operational testing with a live-fire evaluation will occur in the second quarter of FY 2022 with a closeout report produced upon project completion in the third quarter of FY 2022.</p> <p>-Rapid Response Fentanyl Test Strips (Army): The operational testing of the strips in the second quarter of FY 2022. Results and data will be provided to the Joint Chemical and Biological Community for decision on acquiring for use the third quarter of FY 2022. Project close out report the fourth quarter of FY 2022.</p> <p>-Extended Reality (XR) Helmet-Mounted Display (Navy): Extended Reality (XR) Helmet Mounted Display (Navy): This project comparatively tests emerging XR technologies for T-6B operational flight trainers. Integration of the XR helmet display with the cockpit will occur in the second quarter of FY 2022. An evaluation report will be completed by the third quarter of FY 2022. The project will close out with a transition decision in the fourth quarter of FY 2022.</p> <p>-Precision Vertical Take-off Unmanned Aerial System (VTUAS) (Navy): Test and evaluation at bench level occurred in the third quarter of FY 2021. Operational test and demonstration of product planned for the third quarter of FY 2022. A closeout report will be produced upon project completion in the third quarter of FY 2022.</p>					

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>-Counter-Unmanned Aircraft Systems (C-UAS) for Vehicle Protection Systems (Army): Articles received and mounted on vehicles for operational testing the third quarter of FY 2021 through the second quarter of FY 2022. Range testing to include unit level utilization evaluation continues in the second quarter of FY 2022. A closeout report will be produced upon project completion in the third quarter of FY 2022.</p> <p>-Space Qualification Testing of Event-Based Sensors (Air Force): Space Qualification Testing and Orbital mission assessment completed in the first quarter of FY 2022. Mission assessment and recommendation reports commence in the second quarter of FY 2022. Final report and project close out to occur in the fourth quarter of FY 2022.</p> <p>-Comparative Real-Time Air Quality Sensing (Air Force): Phase 4 testing completed in the second quarter of FY 2022. Phase 5 testing to in the third quarter of FY 2022. Technology demonstration to occur in the fourth quarter of FY 2022. A procurement decision will be made and a close out report will be submitted in the fourth quarter of FY 2022.</p> <p>-Non-kinetic Defeat of Small Unmanned Aerial Systems (Army): Effort will fabricate and deliver contractor-designed, remotely operated, low-collateral Counter-Unmanned Aerial Systems (C-UAS) prototype system in the second quarter of FY 2022. The contractor will build and deliver the prototype hardware components that meets the requirements of the government in the third quarter of FY 2022. Phase II: Sensor Integration & Final Testing with a Cueing Sensor for initial detection of the UAS threat evaluated the third quarter of FY 2022. This will evaluate the performance of the Auto Response and obtain a Safety Release for the operational testing. The operational testing will be conducted immediately after evaluation, but with operational users in a realistic, relevant environment in the fourth quarter of FY 2022. Final test report, procurement decision, and project closeout to completed in the fourth quarter of FY 2022.</p> <p>-Vehicle Mounted Camouflage (Army): Comparative testing vehicles coverings that reduce detection across multiple spectrum bands including infrared, microwave, and radar to increase survivability in contested environments. Field testing of the camouflage will take place during the first through third quarters of FY 2022. Test report and procurement decision will be made in the fourth quarter of FY 2022.</p> <p>-Water Free Chemical Decontaminant System (Army): Limited efficacy testing and equipment compatibility testing of the decontaminant agent will take place between 1Q FY 2022 and the third quarter of FY 2022. Test report will be completed by the fourth quarter of FY 2022 which will used by the Program of Record to support follow-on demonstrations and a procurement decision.</p> <p>-Water/Land Initiated Sensing Aerial Disconnect (USSOCOM): User evaluation will take place during the first to third quarter of FY 2022. Project will close out and evaluation report completed in the third quarter of FY 2022.</p>			

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Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603133D8Z / <i>Foreign Comparative Test</i> <i>ing</i>		Project (Number/Name) 313 / <i>Foreign Comparative Testing</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>-Active Protection Systems for Light Armored Vehicles (Navy/USMC): Live fire testing in the first quarter of FY 2022. Project will close out and procurement decision made by Program Executive Office (PEO) Land Systems in the third quarter of FY 2022.</p> <p>-Organic Precision Fires – Infantry, Light (Navy/USMC): Phase one flight testing in 1Q FY 2022 with a down select to one vendor. Phase two evaluation testing will take place during the second and third quarters of FY 2022. Project will complete and procurement decision made by the program manager to be included in the Aerial Loitering Munitions program in the third quarter of FY 2022.</p> <p>-Portable High Power Directed-Energy Systems for Aviation Support (Navy): Phase one validation testing to complete in the second quarter of FY 2022. Field trials will take place during the third and fourth quarters of FY 2022. Project will complete and, if successful, this technology will be added to the Authorized Equipment Lists for Naval and Marine squadrons in the fourth quarter of FY 2022.</p> <p>FY 2023 Plans: Description: The Under Secretary of Defense for Research and Engineering (OUSD R&E) Mission Prototypes (MP) Office, selects multiple low-cost projects in the areas of Force Application, Force Protection, Force Support, Logistics, Artificial Intelligence and Machine Learning, Robotics and Autonomous Systems, Interoperability, and Countering Unmanned Systems. These projects were selected to deliver prototypes for evaluation, assessment, and Service adoption within 12 to 36 months.</p> <p>FY 2023 Projects:</p> <p>-Event-Based Sensing for Moving Target Indication (MTI) (Air Force): Bench testing and acceptance in 4Q FY 2022. Stratospheric flight testing planed in FY 2023.</p> <p>-Nanostructured Graphene Composites for Microwave Attenuation (Army): Operational evaluations in 1Q FY 2023. Additional tests to evaluate mechanical and thermal properties will occur in 2Q – 3Q FY 2023.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding decreases from FY 2022 to FY 2023 due to completion of on-going projects from prior years. Additionally, the remaining funding will be allocated for the selection of new projects that will commence in FY 2022. Projects will be selected through a merit-based process and will address current OUSD R&E critical technology areas, and Service readiness requirements.</p>					
Title: Foreign Comparative Testing Prototype Focus Areas			0.000	7.551	25.007

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603133D8Z / <i>Foreign Comparative Test ing</i>	Project (Number/Name) 313 / <i>Foreign Comparative Testing</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>Description: Previously funded effort. The FCT program will select new projects to evaluate allied/partner nation technologies that address emerging DoD capability gaps and provide substantial cost, schedule, and/or performance benefit to the warfighter. As projects are selected, they will be reported individually. Prototype evaluation will be aligned to the National Defense Strategy (NDS) and current Office of the Under Secretary of Defense, Research and Engineering critical technology areas, to deliver increased readiness and a more lethal Joint Force while strengthening alliances, attracting new partners, and achieving greater performance and affordability.</p> <p>FY 2022 Plans: FCT anticipates supporting ten to fifteen new projects spread across the USD R&E critical technology areas and Service readiness requirements in FY 2022. Deliverables will include integrated products and software that enhance warfighting capabilities across multi-domain battlefield environments. This will be accomplished through test and evaluation of prototypes, demonstrations, and concept experimentation in coordination with the Services and U.S. Special Operations Command and other DoD Agencies.</p> <p>FY 2023 Plans: FCT anticipates supporting twenty to twenty-four new projects spread across the USD R&E critical technology areas and Service readiness requirements in FY 2023. Deliverables will include integrated products and software that enhance warfighting capabilities across multi-domain battlefield environments. This will be accomplished through test and evaluation of prototypes, demonstrations, and concept experimentation in coordination with the Services and United States Special Operations Command and other DoD Agencies.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: This funding will be allocated for the selection of new projects that will commence in FY 2022. Projects will be selected through a merit-based process and will address current OUSD R&E critical technology areas and Service readiness requirements. Funding increases from FY 2022 to FY 2023 due to completion of on-going projects from prior years.</p>			
Accomplishments/Planned Programs Subtotals		23.651	25.352
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy Successful FCT projects support capability acquisition in several ways: technology upgrade insertion into a current platform or program providing greater capability or prolonging the life of the weapon system, informed/refined requirements for planned systems, or direct transition/procurement. FCT leverages the Services' and			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603133D8Z / <i>Foreign Comparative Test ing</i>	Project (Number/Name) 313 / <i>Foreign Comparative Testing</i>
<p>Defense Agencies' most efficient and effective acquisition approaches for rapid prototyping. This includes using Other Transaction Authorities and new or existing contract vehicles within middle-tier acquisition strategy. The FCT Program supports the Service Executive Acquisition strategies and works with each Services and U.S. Special Operation Command to enhance the speed of new technology infusion to maintain overmatch on tomorrow's battlefield.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)					PE 0603183D8Z I Joint Hypersonic Technology Development & Transition							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	51.178	52.156	0.000	52.156	50.184	49.142	48.099	49.063	Continuing	Continuing
066: Joint Hypersonic Transition Office (JHTO)	0.000	0.000	51.178	52.156	0.000	52.156	50.184	49.142	48.099	49.063	Continuing	Continuing

Note

New Start (Y/N): No

In FY 2020 and FY 2021, the Joint Hypersonics Transition Office (JHTO) was funded via Congressional Add to better synchronize hypersonic technology development and workforce development. Those funds were administered through the Prompt Global Strike Capability Development Program Element (PE) - (0604165D8Z), a budget activity five (BA-5) PE. In FY 2022, the Office of the Secretary of Defense established the Joint Hypersonic Technology Development & Transition Program Element (0603183D8Z), a budget activity three (BA-3) PE, to better align the PE and budget activity to the JHTO mission and to congressional intent.

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Build Sustainable and Long-Term Advantage, and Build a Resilient Joint Force and Defense Ecosystem.

The Joint Hypersonics Transition Office (JHTO) within the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) was created to establish a university consortium for hypersonics research; support workforce development; expedite testing, evaluation, and acquisition of hypersonic technologies to meet the stated needs of the warfighter, including flight testing, ground-based-testing, and underwater launch testing; ensure that prototyping demonstration programs on hypersonic systems integrate advanced technologies to speed the maturation and deployment of future hypersonic systems; develop strategies and roadmaps for hypersonic technologies to enable the transition of such technologies to future operational capabilities for the warfighter; and, develop and implement a strategy for enhancing the current and future hypersonics workforce.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603183D8Z I <i>Joint Hypersonic Technology Development & Transition</i>
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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	51.340	0.000	0.000	0.000
Current President's Budget	0.000	51.178	52.156	0.000	52.156
Total Adjustments	0.000	-0.162	52.156	0.000	52.156
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• FFRDC	-	-0.162	-	-	-
• Adjustments to Budget Year	-	-	50.358	-	50.358
• Economic Assumption	-	-	1.798	-	1.798

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603183D8Z / Joint Hypersonic Technology Development & Transition				Project (Number/Name) 066 / Joint Hypersonic Transition Office (JHTO)			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
066: Joint Hypersonic Transition Office (JHTO)	0.000	0.000	51.178	52.156	0.000	52.156	50.184	49.142	48.099	49.063	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2020 and FY 2021, the Joint Hypersonics Transition Office (JHTO) was funded via Congressional Add to better synchronize hypersonic technology development and workforce development. Those funds were administered through the Prompt Global Strike Capability Development Program Element (PE) (0604165D8Z), a budget activity five (BA-5) PE. In FY 2022, the Office of the Secretary of Defense established the Joint Hypersonic Technology Development & Transition Program Element (0603183D8Z), a budget activity three (BA-3) to better align the PE and budget activity to the JHTO mission and to congressional intent.

A. Mission Description and Budget Item Justification

The Joint Hypersonics Transition Office (JHTO), within the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)), was created to establish a university consortium for hypersonics research and support workforce development; expedite testing, evaluation, and acquisition of hypersonic technologies to meet the stated needs of the warfighter, including flight testing, ground-based-testing, and underwater launch testing; ensure that prototyping demonstration programs on hypersonic systems integrate advanced technologies to speed the maturation and deployment of future hypersonic systems; develop strategies and roadmaps for hypersonic technologies to enable the transition of such technologies to future operational capabilities for the warfighter; and develop and implement a strategy for enhancing the current and future hypersonics workforce.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: University Consortium for Applied Hypersonics (UCAH)	-	22.194	28.333
Description: The JHTO established the University Consortium for Applied Hypersonics and plans to solicit research projects through the Consortium that address priorities and gaps identified by the JHTO Hypersonics Science and Technology (S&T) Roadmap, focusing on workforce development, applied research and advanced technology development related to the hypersonics mission. To facilitate development of the next generation hypersonics workforce, the JHTO intends to leverage the Consortium to award scholarships to graduate students who are focusing on key hypersonic development areas. Additionally, the Consortium will host Consortium Industry Days, Project Industry Days, and participate in career/internship fairs to cross-level information and enhance workforce development.			
FY 2022 Plans: The JHTO plans to solicit applied research projects through the Consortium that address priorities and gaps identified by the JHTO Hypersonics Science and Technology (S&T) Roadmap, focusing on workforce development, applied research and advanced technology development related to the hypersonics mission. In FY 2021, the JHTO brought 17 such three-year projects under contract, leveraging the expertise of 31 universities, 16 companies, and three national laboratories. In FY 2022, the JHTO			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603183D8Z / <i>Joint Hypersonic Technology Development & Transition</i>	Project (Number/Name) 066 / <i>Joint Hypersonic Transition Office (JHTO)</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>plans to solicit and award 12 additional three-year and eight one-year projects. The JHTO will continue to use the Consortium's unique combination of academic, industry, and national laboratory expertise as represented by the Consortium's Technical Advisory Board, Industry Advisory Board, National Laboratory Advisory Board, and Outreach and Workforce Development Committee to facilitate cross-disciplinary/cross-organization collaboration and provide advice and assistance to the government hypersonics enterprise. To facilitate development of the next generation hypersonics workforce, the JHTO intends to leverage the Consortium to award scholarships to graduate students who are focusing on key hypersonic development areas. The scholarship program is contingent upon the ability of the Other Transaction Authority agreement to accommodate scholarships. Additionally, the Consortium will host Consortium Fora twice each year, Project Reviews, and participate in career/internship fairs to cross-level information and enhance workforce development.</p> <p>FY 2023 Plans: FY 2023 base plans for the UCAH are a continuation of the path identified for FY 2022, to include continued execution of research projects through the Consortium with the planned expansion of scope of the projects to further address priorities and gaps identified by the JHTO Hypersonics Science and Technology (S&T) Roadmap.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: UCAH funding increase supports the planned expansion of scope of projects under management within the Consortium.</p>			
<p>Title: Navigation, Guidance and Controls (NGC) Science and Technology Development</p> <p>Description: In alignment with the jointly-developed Hypersonics S&T Roadmap, the JHTO funds NGC science and technology projects to improve the operational capabilities of both offensive and defensive hypersonic systems. These projects focus on navigation in contested environments, on-vehicle trajectory generation, communications risk reduction, guidance electronics, and conformal antenna development. Additional details regarding these projects are sensitive and/or classified and can be provided upon request.</p> <p>FY 2022 Plans: Continue activities initiated under the Prompt Global Strike Capability Development Program Element (0604165D8Z) Project code 065, Joint Hypersonics. Additional details regarding FY 2022 NGC projects are sensitive and/or classified and can be provided upon request.</p> <p>FY 2023 Plans: Continue prioritized activities from FY 2022. Additional details regarding FY 2022 NGC projects are sensitive and/or classified and can be provided upon request.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>		-	6.678
			4.817

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603183D8Z / <i>Joint Hypersonic Technology Development & Transition</i>	Project (Number/Name) 066 / <i>Joint Hypersonic Transition Office (JHTO)</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
Decrease in funding is associated with re-prioritization to focus on near-term technology insertion, reducing priority of NGC efforts.			FY 2023
Title: Propulsion Science and Technology Development Description: In alignment with the jointly-developed Hypersonics S&T Roadmap, the JHTO funds propulsion science and technology projects designed to enhance propulsion capabilities for both offensive and defensive hypersonic systems. These efforts will close critical gaps in the development of hypersonic cruise missiles and enhance range and/or payload capacity of boost-glide systems. Focus areas for these projects include solid rocket motor component technologies, expanding the operating envelope of Dual-Mode Ramjet/Scramjet propulsion systems, developing new actuator technologies for axial thrusters, and establishing a proof-of-principle for an improved endothermic fuel for hypersonic applications. Additional details regarding these projects are sensitive and/or classified and can be provided upon request. FY 2022 Plans: Continue activities initiated under the Prompt Global Strike Capability Development Program Element (0604165D8Z) Project code 065, Joint Hypersonics. Additional details regarding FY 2022 propulsion projects are sensitive and/or classified and can be provided upon request. FY 2023 Plans: Continue prioritized activities from FY 2022. Additional details regarding FY 2022 propulsion projects are sensitive and/or classified and can be provided upon request. FY 2022 to FY 2023 Increase/Decrease Statement: Decrease in FY 2023 funding reflects increased priority on, and funding for, FY 2023 UCAH projects.		-	4.310
Title: Systems Engineering, Design and Analysis (SEDA) Science and Technology Development Description: In alignment with the jointly-developed Hypersonics S&T Roadmap, the JHTO funds SEDA science and technology projects designed to: (1) improve the modeling and prediction of hypersonic vehicle plumes, wakes, and signatures, and (2) provide performance baselines for offensive and defensive systems. Additional details are sensitive and/or classified and can be provided upon request. FY 2022 Plans: Continue activities initiated under the Prompt Global Strike Capability Development Program Element (0604165D8Z) Project code 065, Joint Hypersonics. Additional details regarding FY 2022 SEDA projects are sensitive and/or classified and can be provided upon request. FY 2023 Plans:		-	1.817

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603183D8Z / <i>Joint Hypersonic Technology Development & Transition</i>		Project (Number/Name) 066 / <i>Joint Hypersonic Transition Office (JHTO)</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Continue prioritized activities from FY 2022. Additional details regarding FY 2022 SEDA projects are sensitive and/or classified and can be provided upon request.					
FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.					
Title: Materials, Structures and Manufacturing (MSM) Science and Technology Development			-	2.278	1.817
Description: In alignment with the jointly-developed Hypersonics S&T Roadmap, the JHTO funds MSM science and technology projects essential to develop new high-temperature materials for hypersonic applications and to design more efficient and effective manufacturing methods for hypersonic structural components. Specific projects seek to characterize alternative ceramic matrix composites for hypersonics, improve the ability to produce multi-phase monolithic ceramic dielectric materials, test and characterize the performance of leading edge coatings, and improve manufacturing processes to build cruiser fins. Additional details regarding these projects are sensitive and/or classified and can be provided upon request.					
FY 2022 Plans: Continue activities initiated under the Prompt Global Strike Capability Development Program Element (0604165D8Z) Project code 065, Joint Hypersonics. Additional details regarding FY 2022 MSM projects are sensitive and/or classified and can be provided upon request.					
FY 2023 Plans: Continue prioritized activities from FY 2022. Additional details regarding FY 2022 MSM projects are sensitive and/or classified and can be provided upon request.					
FY 2022 to FY 2023 Increase/Decrease Statement: Decrease in FY 2023 funding reflects increased priority on, and funding for, FY 2023 UCAH projects.					
Title: Ordnance Science and Technology Development			-	3.680	4.353
Description: In alignment with the jointly-developed Hypersonics S&T Roadmap, the JHTO funds ordnance science and technology projects to better understand hypersonic ordnance effects and improve those effects across a broad range of target sets. Projects will develop and demonstrate a survivable fuze system designed to function under extreme hypersonic terminal conditions, model shock loads associated with a multi-mission warhead, and conduct high-fidelity modeling to analyze and optimize the effects of hypersonic munitions. Additional details regarding these projects are sensitive and/or classified and can be provided upon request.					
FY 2022 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603183D8Z I Joint Hypersonic Technol ogy Development & Transition	Project (Number/Name) 066 I Joint Hypersonic Transition Office (JHTO)		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Continue activities initiated under the Prompt Global Strike Capability Development Program Element (0604165D8Z) Project code 065, Joint Hypersonics. Additional details regarding FY 2022 Ordnance projects are sensitive and/or classified and can be provided upon request. FY 2023 Plans: Continue prioritized activities from FY 2022. Additional details regarding FY 2022 Ordnance projects are sensitive and/or classified and can be provided upon request. FY 2022 to FY 2023 Increase/Decrease Statement: Reflects increased priority on, and funding for, FY 2023 UCAH projects.				
Title: Aerodynamics and Aerothermodynamics Science and Technology Development Description: In alignment with the jointly-developed Hypersonics S&T Roadmap, the JHTO funds aerodynamics and aerothermal science and technology projects to enhance aero optics modeling and simulation testing. This project seeks to increase the fidelity of infrared aero optics modeling and simulation data while driving down man-hours through creation/validation of a more useful and collaborative collection format. Additional details are sensitive and/or classified and can be provided upon request. FY 2022 Plans: Continue activities initiated under the Prompt Global Strike Capability Development Program Element (0604165D8Z) Project code 065, Joint Hypersonics. Additional details regarding FY 2022 aerodynamics and aerothermal science and technology projects are sensitive and/or classified and can be provided upon request. FY 2023 Plans: Continue prioritized activities from FY 2022. Additional details regarding FY 2022 aerodynamics and aerothermal projects are sensitive and/or classified and can be provided upon request. FY 2022 to FY 2023 Increase/Decrease Statement: Decrease in FY 2023 funding reflects increased priority on, and funding for, FY 2023 UCAH projects.		-	3.335	3.017
Title: Tactical High-speed Offensive Ramjet for Extended Range (THOR-ER) Description: In FY 2022, THOR-ER transitioned from Program Element 0603338D8Z Defense Modernization and Prototyping. The THOR-ER project will develop and demonstrate a full-scale missile prototype incorporating advanced solid fuel ramjet technologies, culminating in a series of operationally relevant flight demonstrations. THOR-ER enables leap-ahead gains in missile range and cruise speed while maintaining form factors similar to currently fielded solid-rocket motor systems. Technology developed as part of the THOR-ER project will enhance the affordability and survivability of next generation weapon systems.		-	1.940	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603183D8Z / <i>Joint Hypersonic Technology Development & Transition</i>	Project (Number/Name) 066 / <i>Joint Hypersonic Transition Office (JHTO)</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>THOR-ER is a co-development effort partnering with the U.S. Navy Naval Air Warfare Center, Weapons Division China Lake; the Norwegian Defence Research Establishment; and, the Norwegian industrial base partner, Nammo.</p> <p>FY 2022 Plans: In FY 2022, flight testing of the full-scale missile prototypes will commence followed by an iterative series of flight test and prototype refinement phases through FY 2024.</p> <p>FY 2023 Plans: JHTO has no FY 2023 plans associated with THOR-ER.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: JHTO activities associated with THOR-ER complete with FY 2022 funding.</p>			
<p>Title: JHTO Systems Engineering Field Activity at Naval Surface Warfare Center Crane Division (NSWC Crane)</p> <p>Description: Supports systems engineering and integration for hypersonics development to generate efficiencies and facilitate technology transition. Support will include coordinating with systems engineering teams across the Services and programs; negotiating more modular Government Reference Architectures to support individual programs; define and execute system on-ramping plans, and guide accelerated development plans. Additionally, the activity will represent the JHTO as a technical execution area co-lead for workforce development.</p> <p>FY 2022 Plans: Continue to support cross-service systems engineering, technology transition, and workforce development.</p> <p>FY 2023 Plans: Continue to support cross-service systems engineering, technology transition, and workforce development.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: No increase/decrease in funding from FY 2022 to FY 2023.</p>		-	4.685
Accomplishments/Planned Programs Subtotals		-	52.156
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>					R-1 Program Element (Number/Name) PE 0603225D8Z I <i>Joint DOD DOE Munitions Technology Development</i>							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	18.809	19.003	18.898	0.000	18.898	19.457	19.847	20.264	20.668	Continuing	Continuing
225: <i>Joint DOD DOE Munitions</i>	-	18.809	19.003	18.898	0.000	18.898	19.457	19.847	20.264	20.668	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression and Prevail in Conflict, Defend the Homeland, Build Sustainable and Long-Term Advantage, and Build a Resilient Joint for and Defense Ecosystem.

The Department of Defense (DoD)/Department of Energy (DOE) Joint Munitions Technology Development Program (JMP) enables military superiority by setting and driving the critical path for cutting-edge capability-driven munitions science and technology (S&T) to equip the Joint Force for the future fight. The JMP portfolio comprises essential cross-cutting and foundational S&T investments that enable Future Force operational capabilities in the near, mid, and far term. In setting the technical direction for the DoD, the Joint DoD/DOE Munitions Program performs S&T to advance the state of the art for non-nuclear munitions technology in the focus areas of decision tools, delivery, munition controls, lethal effects, and readiness.

A Memorandum of Understanding signed in 1985 by the DoD and DOE provides the basis for the cooperative effort. Through this interdepartmental cooperation and joint investment (DOE matches the DoD's investment at 1:1), DoD leverages the DOE's substantial investments in intellectual capital and highly specialized skills, advanced scientific equipment and facilities, and computational tools not available within the DoD, bolstering good stewardship of taxpayer dollars. The portfolio is monitored by a panel of Tri-Service Senior Executive Service-nominated subject matter experts who conduct rigorous technical and programmatic review to prioritize essential investments. The technology, resources, and capabilities return for DoD in this program is estimated at two to three times its investment.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603225D8Z I <i>Joint DOD DOE Munitions Technology Development</i>
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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	18.861	19.063	0.000	0.000	0.000
Current President's Budget	18.809	19.003	18.898	0.000	18.898
Total Adjustments	-0.052	-0.060	18.898	0.000	18.898
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.048	-			
• Other Reprogramming	-0.004	-	-	-	-
• FFRDC	-	-0.060	-	-	-
• Adjustments to Budget Year	-	-	18.246	-	18.246
• Economic Assumption	-	-	0.652	-	0.652

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603225D8Z / Joint DOD DOE Munition s Technology Development				Project (Number/Name) 225 / Joint DOD DOE Munitions			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
225: Joint DOD DOE Munitions	-	18.809	19.003	18.898	0.000	18.898	19.457	19.847	20.264	20.668	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Projects within the Joint Munitions Technology Development Program (JMP) portfolio enable capability advancements in: higher speed and hypersonic delivery, counter unmanned aerial systems, microelectronics, longer range precision effects, networked and collaborative systems of systems, agility at the engagement level, logistics in contested environments, increased capacity/affordable mass, survivability during deployment and target engagement, rapid technology refreshes/adaptation to changing threats, post-launch re-programming, open systems architectures, and weapon cyber-resiliency. JMP investments may be leverageable for nuclear deterrence, space, quantum science, and 5G, but the portfolio does not specifically focus on these capability areas.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Joint DoD/DOE Munitions Technology Development	18.809	19.003	18.898
<p>Description: DoD/DOE Munitions Technology Development focuses on the following key areas: (1) the development of in silico decision tools for munition design and in-theater function; (2) innovation of munitions delivery technology to include weapon bodies, propulsion systems, propellants, and environment/target hardening; (3) development of state-of-the-art munition controls for fuzing, microelectronics, power, sensors, kill chains, and survivable components; (4) design of lethal effects through explosive, formulation, warhead, and target damage innovations; and (5) development and transition of decisive readiness technology for munitions through the full munitions lifecycle (design through end-of-life). The JMP is organized accordingly with five Technical Coordinating Groups (TCGs), Decision Tools, Delivery, Munition Controls, Lethal Effects, and Readiness.</p> <p>FY 2022 Plans: In FY 2022, the portfolio will address priority DoD S&T capability advancements and leverages DOE investment.</p> <ul style="list-style-type: none"> • The Decision Tools focus area will a) employ machine learning code development to support lethality assessments/ weaponizing models, b) accelerate decision tool codes with faster processing, c) demonstrate improved munitions and subsystems modeling and simulation in complex shock environments, and d) deliver improved material model packages for hard and deeply buried targets. • The Delivery focus area will: a) deliver integrated warhead cases for high speed perforation/penetration into buildings, light bunkers, and maritime targets, and b) fabricate and test materials for hypersonics. • Munition Controls will a) demonstrate design improvement for a novel supercapacitor, b) optimize explosive-train design in the presence of competing system requirements, c) deliver a transformer component in a relevant form factor, d) demonstrate 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603225D8Z / Joint DOD DOE Munitions Technology Development	Project (Number/Name) 225 / Joint DOD DOE Munitions	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>survivability of a capacitor for miniaturized fuzing, e) demonstrate development of a component for hardened electronic, verify a GPS-denied navigation solution, and f) advance and transition sensor technology battery innovations.</p> <ul style="list-style-type: none"> • Lethal Effects will a) demonstrate explosive volume reduction using additive manufacturing, b) demonstrate increase in kinetic energy for an additively manufactured subsystem, c) deliver a characterization dataset for novel energetics, d) predict effects of gun launch on energetics, e) validate materials and diagnostics for improved energetics, f) deliver a database for warhead materials, g) improve energetic systems performance, h) deliver a model to predict temperature effects on lethal systems, i) validate an arena-test alternative, and j) produce a dataset for enhanced target damage. • Readiness will: a) baseline additively manufactured parts for qualification standards, b) deliver test method for a power system failure mode analysis, and c) identify mechanism for adhesive failures in components. <p>FY 2023 Plans: In FY 2023, the portfolio will address priority DoD S&T capability advancements and leverages DOE investment.</p> <ul style="list-style-type: none"> • The Decision Tools focus area will a) experimentally validate a high-fidelity damage model to produce datasets suitable for training machine learning algorithms supporting lethality assessments/weaponeering, b) transfer a high-performance decision tool code to a graphical processing unit platform to accelerate calculation speed, c) apply experimental high-explosives data to simulations and validate predictions for high explosives encountering complex shock environments during employment, and d) develop particle package testing and extraction for accurate prediction of primary and secondary debris flows from weapon-target interactions. • The Delivery focus area will a) validate a multi-fidelity aerodynamic database for relevant weapon geometries and package a predictive code to reduce development and fielding times of advanced flight body geometries. • Munition Controls will a) develop a prototype production process for high energy density supercapacitor and b) demonstrate a hardware component capable of a single-radar mode for a GPS-denied navigation solution. • Lethal Effects will a) integrate advanced diagnostics into an arena-test alternative to improve munitions effectiveness measurements, and b) validate machine-learning approach for designing energetic material prototype production. • Readiness will a) determine local corrosion disparities between conventional and additively-manufactured parts in operational use, b) validate a test method for a power system failure mode analysis, and c) develop, verify, and validate a predictive model for adhesive failures in components. <p>FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.</p>			
Accomplishments/Planned Programs Subtotals		18.809	19.003
			18.898

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603225D8Z I Joint DOD DOE Munition s Technology Development	Project (Number/Name) 225 I Joint DOD DOE Munitions
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy N/A		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)</i>	PE 0603288D8Z / <i>Science and Technology (S&T) Analytic Assessments</i>											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	87.280	19.107	23.936	24.052	-	24.052	24.756	25.289	25.818	26.336	-	-
328: <i>Science and Technology Analytic Assessments</i>	87.280	12.944	17.259	16.825	-	16.825	17.237	17.533	17.900	18.259	-	-
177: <i>Technology Watch/Horizon Scanning</i>	0.000	6.163	6.677	7.227	-	7.227	7.519	7.756	7.918	8.077	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Defend the Homeland, Deter Aggression and Prevail in Conflict, Build Sustainable and Long-Term Advantage, and Build a Resilient Joint Force and Defense Ecosystem.

This Program Element (PE) directly supports the Strategic Intelligence and Analysis Cell (SIAC) for the Office of the Under Secretary of Defense, Research and Engineering (OUSD(R&E)) that focuses on understanding the capabilities and vulnerabilities of potential adversaries, assessing U.S. capabilities, tracking global technology trends, assessing emerging threats, and identifying potential opportunities that warrant action and investment. Throughout this process the analysis will be tightly coupled with both the Intelligence community (IC) and the operational community. Global science and technology (S&T) awareness and context is gained and incorporated through the Technology Watch/Horizon Scanning (TW/HS) project, and when combined with threat-based operational and technical analyses, integrates DoD technology, engineering, and acquisition planning to inform the strategic technology development decisions of the OUSD(R&E).

Analysis and assessments are focused on challenges related to National Defense Strategy (NDS) objectives and competitors' research and development trends. Two main lines of effort accomplish this mission:

1) All-source intelligence integration into the analytic and conceptual baseline, framework, and development efforts across the R&E enterprise provides a bridge between the IC and OUSD(R&E). The most relevant intelligence analysis and coordinated integration of intelligence with technology development trends informs strategic investment direction.

- An annual S&T Intelligence Needs Plan (INP) is delivered to the IC, providing production centers with the intelligence requirements of the S&T community. The INP improves short-term intelligence integration through the direct return of products relevant to enterprise needs; as well as long-term collection and planning processes in the IC as a customer demand signal.

- Open-source analysis, technology watch, and horizon scanning identify emerging and disruptive technology trends in areas of future military utility to inform strategic investment decisions;

2) Net technical assessments (NTA) are conducted using integrated information from the acquisition, intelligence, operational, and technical communities to quantify key attributes of emerging critical challenges and assess counter technology options. Independent analysis is performed by industry, academic, and Federally Funded Research and Development Center/ University Affiliated Research Center (FFRDC/UARC) partners.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603288D8Z I <i>Science and Technology (S&T) Analytic Assessments</i>
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- Technology wargames inform NTAs and identify opportunities stemming from emerging technologies; evaluate the demands of the future operational environment; and integrate the operational, technology, and intelligence communities across the DoD and IC.

Due to the emergent nature of these challenges and threats, specific analytic foci are unlikely to be identified beyond the current budget year. The process for developing and executing assessments can span fiscal years and may have multiple phases as trends progress and new information arises.

B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	19.775	24.012	0.000	-	0.000
Current President's Budget	19.107	23.936	24.052	-	24.052
Total Adjustments	-0.668	-0.076	24.052	-	24.052
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.664	-			
• Adjustments to Budget Year	-	-	23.222	-	23.222
• Other Program Adjustments	-0.004	-	-	-	-
• Program Adjustments	-	-	0.830	-	0.830
• FFRDC Reduction	-	-0.076	-	-	-

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603288D8Z / Science and Technology (S&T) Analytic Assessments				Project (Number/Name) 328 / Science and Technology Analytic Assessments			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
328: Science and Technology Analytic Assessments	87.280	12.944	17.259	16.825	-	16.825	17.237	17.533	17.900	18.259	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Science and Technology (S&T) Analytic Assessments Project Code conducts net technical assessment through the integration of intelligence, comparative assessment, and independent analysis to shape the development of innovative capabilities to address emerging threats from a diverse range of state and non-state actors as outlined in the NDS and as reported through the IC. The emerging nature of the problem sets makes specific identification of project topics beyond the budget year unlikely.

Project funding supports independent technical analysis performed by DoD-sponsored industry, academic, and FFRDC/UARC performers and DoD laboratories. Main lines of effort include:

- Technical threat assessments, informed by IC production, that identify areas of future technology overmatch.
- Quantitative, engineering-level analyses of potential novel technology and concepts that address capability gaps and potential counters to intelligence-derived emerging threat technologies in future environments.
- Net technical assessment of existing and planned U.S. capabilities and weapons systems using emerging threat systems and capabilities in future operating environments.
- Technology maturation forecasting characterizes the future maturation of defense-related technologies in related aggregate groups of capability enablers identified by TW/HS efforts and independent FFRDC/UARC experts.

Comparative assessments identify prioritized operational issues and associated technology focus areas through comprehensive Kill Chain Analysis (KCA) across all domains through the year 2040. These assessments inform technology investment decisions. Characterizations of future operating environments and challenges inform the scoping and design efforts of mission engineering and mission integration analyses for DoD. Main lines of effort include:

- KCA across Defense Planning Scenarios and other relevant DoD vignettes identifies and characterizes capability disadvantages and opportunities across the battlespace, providing detailed characterizations of U.S. and adversary capabilities and technology development efforts that enable mission-oriented analysis of emerging threats.
- Technology superiority assessments of potential technology developments and their impacts on future military capabilities.
- Standardized technology-focused timelines to summarize and track DoD progress toward technical dominance in priority technology areas.
- Operational Environment Packages (OEPs) that characterize the future operational environment through integration of strategy, doctrine, policy, concepts, technology, and intelligence. OEPs provide a common analytic baseline for examining technologies, capabilities, gaps, and opportunities.
- Technology wargames identify opportunities stemming from emerging technologies, evaluate the demands of the future operational environment, and integrate the operational, technology, and intelligence communities. Wargame outputs inform future concept and capability development, prototyping and experimentation activities, threat forecasting, and DoD S&T investments.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603288D8Z / Science and Technology (S&T) Analytic Assessments	Project (Number/Name) 328 / Science and Technology Analytic Assessments		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Title: Science and Technology Analytic Assessments			12.944	17.259	16.825
Description: The Science and Technology (S&T) Analytic Assessments Project code directly supports the development of innovative capabilities to meet the emerging threats from the diverse range of state and non-state actors confronting the United States. These capabilities support the objectives of the National Defense Strategy and the National Military Strategy. Throughout this process the analysis will be tightly coupled with both the IC and the operational community.					
Accordingly, the following activities are planned for FY 2022 and FY 2023:					
FY 2022 Plans:					
Comparative Assessment:					
- Produce and update foundational data of U.S. and adversary capabilities to enable mission-oriented analysis of emerging threats.					
- Assess emerging operational scenarios against future Red and Blue capability timelines.					
- Produce Operational Environment Packages to characterize the future Joint Force operational environment to provide a common analytic baseline for assessing future Red and Blue capabilities and asymmetries across the near-, mid-, and far terms.					
- Identify and characterize key trends likely to impact the future operating environment.					
- Produce comparative displays of U.S. and threat capability development plans across all operating domains over the next 20 years.					
- Design and execute Emerging Disruptive Technology (EDT) wargames to inform and better align DoD critical technology area activities, joint concept and capability development, and threat forecasting. Specific topics will be selected based on SIAC and OUSD(R&E) analytic priorities.					
- Conduct table top exercises to support the support OUSD(R&E) investment prioritization across all critical technology efforts.					
Independent Technical Analysis:					
- Conduct technical threat assessments informed by IC reporting to identify gaps in U.S. capability for critical threats.					
- Conduct analysis of potential novel technology and concepts to address capability gaps and potential counters to intelligence-derived emerging threat technologies in future environments.					
- Conduct independent assessment of U.S. and potential adversary critical capability and technology development.					
- Produce net technical assessments within DoD critical technology areas of existing and planned U.S. capabilities and weapons systems using emerging threat systems and capabilities in future operating environments.					
- Conduct technology maturation analysis to improve Horizon Scanning methodologies and processes while informing technology superiority comparison efforts that identify critical emerging technology opportunities for capability overmatch.					
FY 2023 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603288D8Z / <i>Science and Technology (S&T) Analytic Assessments</i>	Project (Number/Name) 328 / <i>Science and Technology Analytic Assessments</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
Continued execution of FY 2022 plans.			
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> There is no significant change between FY 2022 and FY 2023.			
Accomplishments/Planned Programs Subtotals		12.944	17.259
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603288D8Z / Science and Technology (S&T) Analytic Assessments				Project (Number/Name) 177 / Technology Watch/Horizon Scanning			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
177: Technology Watch/Horizon Scanning	0.000	6.163	6.677	7.227	-	7.227	7.519	7.756	7.918	8.077	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2021, the Technology Watch/Horizon Scanning efforts were previously aligned under Program Element 0602234D8Z Project code 535 (Office of Technical Intelligence). This project has been administratively realigned after the reorganization of the Under Secretary of Defense for Acquisition, Technology, and Logistics, but the scope of work and relative funding remains unchanged.

A. Mission Description and Budget Item Justification

The Technology Watch/Horizon Scanning (TW/HS) Program supports emerging and disruptive technology characterization through the integration of all-source intelligence to SIAC analytic efforts, the identification of technology research trends, and the forecasting of future concepts and technology maturation with the potential for military application through 2040. TW/HS activities inform the Department's investment decisions in technology areas to maintain or regain global competitive advantage. The program provides tailored technical assessments that identify the military relevance, research opportunities, and investment targets for emerging and disruptive technologies.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Technology Watch/Horizon Scanning	6.163	6.677	7.227
Description: The program utilizes novel TW/HS capabilities to identify nascent and disruptive technologies that will shape tomorrow's future by integrating intelligence-based and open-source information to characterize today's global S&T environment. This characterization, in combination with other technical analysis performed by SIAC, will inform strategic technology development decisions.			
FY 2022 Plans: Continue to leverage all-source intelligence to identify emerging technology areas and trends to inform potential investment areas for rapid capability development. Main lines of effort include: <ul style="list-style-type: none"> - Continued integration of data analytics capabilities and methodologies to conduct technology forecasting analyses. - Analysis of financial data from public, private, and venture capital sources to identify where both U.S. and foreign industries are investing resources in promising areas of technology development. - Conduct horizon scans that identify and track global technology trends. - Technology scouting of government, academia, and industry Critical and Emerging Technology (C&ET) events, to track development and maintain awareness of technology trends. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603288D8Z / <i>Science and Technology (S&T) Analytic Assessments</i>	Project (Number/Name) 177 / <i>Technology Watch/Horizon Scanning</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> - Enhanced technology maturation forecast analyses to identify critical technology enablers and development pathways to future military utility. - Produce an S&T Intelligence Needs Plan, providing the IC with the intelligence requirements in the S&T community as a demand signal in IC planning efforts. - Compile and deliver relevant IC reporting and threat information to analysis, capability, and portfolio development efforts across SIAC and the R&E Enterprise. <p><i>FY 2023 Plans:</i> Continued execution of FY 2022 plans.</p> <p>In FY 2023, SIAC's mission will also focus on expanding Global Research Watch mission objectives through the integration of methodologies and findings within SIAC's portfolios. SIAC will collaborate with international allies and partners to identify emerging technology trends and research activities in the furtherance of common research and analysis opportunities that support a more connected and resilient research ecosystem.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> In FY 2023, SIAC's contributions to the Global Research Watch mission of monitoring and analyzing basic and applied research activities and capabilities on an international scale represents an increase in scope to currently planned and executed technology watch and forecasting efforts.</p>			
Accomplishments/Planned Programs Subtotals		6.163	6.677
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
N/A			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>					R-1 Program Element (Number/Name) PE 0603289D8Z I <i>Advanced Innovative Analysis and Concepts</i>							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	263.220	28.008	46.351	53.890	0.000	53.890	55.371	56.520	57.707	58.861	Continuing	Continuing
329: <i>Advanced Innovative Analysis and Concepts</i>	263.220	28.008	46.351	53.890	0.000	53.890	55.371	56.520	57.707	58.861	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression and Prevail in Conflict, Defend the Homeland, Build Sustainable and Long-Term Advantage, and Build a Resilient Joint Force and Defense Ecosystem.

The Strategic Capabilities Office (SCO) conducts analysis to identify and accelerate the development, demonstration, and transition of game-changing capabilities to shape and counter emerging threats and increase the lethality of the Joint Force in contested environments. In a partnership endeavor across the Office of the Secretary of Defense (OSD), Joint Staff, Combatant Commands (CCMDs), the Services, the Intelligence Community (IC), and other U.S. Government agencies, the SCO combines capability innovation with new concepts for warfighting that leverage new technology areas, including autonomy, artificial intelligence, and machine learning. SCO conducts projects on accelerated timelines, in all warfighting domains, at any classification or access level.

The Advanced Innovative Analysis and Concepts program element supports development, study, and analysis of integrated concepts and prototypes, analysis in support of ongoing efforts to shape and counter emerging threats, cross-Service and cross-Defense/Intelligence concepts, and red-teaming. Projects focus on proving component and subsystem maturity prior to integration in major systems, and may involve risk reduction initiatives. This Program Element also supports the development of concept proposals for assessment by the Technical and Transition Cross Functional Teams established in accordance with the National Defense Authorization Act (NDAA) for FY 2020 for development under the Advanced Innovative Technologies Program Element. Due to the nature of these projects, specific applications and detailed plans are available at a higher classification level.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603289D8Z / <i>Advanced Innovative Analysis and Concepts</i>
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B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	28.524	51.513	0.000	0.000	0.000
Current President's Budget	28.008	46.351	53.890	0.000	53.890
Total Adjustments	-0.516	-5.162	53.890	0.000	53.890
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-5.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.006	-			
• SBIR/STTR Transfer	-0.510	-			
• Adjustments to Budget Year	-	-	53.890	-	53.890
• FFRDC Reduction	-	-0.162	-	-	-

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603289D8Z / Advanced Innovative Analysis and Concepts				Project (Number/Name) 329 / Advanced Innovative Analysis and Concepts			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
329: Advanced Innovative Analysis and Concepts	263.220	28.008	46.351	53.890	0.000	53.890	55.371	56.520	57.707	58.861	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Strategic Capabilities Office (SCO) conducts analysis in support of ongoing efforts to shape and counter emerging threats, with special emphasis on: innovative and architecture-level concepts, cross-Service and cross-Defense/Intelligence concepts, red-teaming, and on a case-by-case basis, research and development projects to demonstrate new concepts. SCO identifies, analyzes, and accelerates the development, demonstration, and transition of selected capabilities to shape and counter emerging threats, and to improve U.S. security posture. In a partnership endeavor across the Office of the Secretary of Defense (OSD), Joint Staff, Combatant Commands (CCMDs), the Services, the Intelligence Community (IC), and other U.S. Government agencies, SCO combines capability innovation with concepts of operation to develop novel, high-leverage approaches to address pressing national security challenges. SCO conducts projects on accelerated timelines, at any classification or access level.

The Advanced Innovative Analysis and Concepts program element supports development, study, and analysis of integrated concepts and prototypes, analysis in support of ongoing efforts to shape and counter emerging threats, cross-Service and cross-Defense/Intelligence concepts, and red-teaming. Projects focus on proving component and subsystem maturity prior to integration in major systems, and may involve risk reduction initiatives. Due to the nature of these projects, specific applications and detailed plans are available at a higher classification level.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Innovative Analysis and Concept Generation	13.437	24.939	27.305
Description: The Strategic Capabilities Office conducts analysis, studies, demonstrations of integrated concepts and prototypes, component and subsystem maturation, and risk-reduction demonstrations in support of ongoing efforts to shape and counter emerging threats, and develops project proposals for prototyping under the Advanced Innovative Technologies Program Element. Due to the nature of these projects, specific applications and detailed plans are available at a higher classification level. This project includes funds required for SBIR/STTR.			
FY 2022 Plans: Continue to innovate in partnership with Services Program Offices and CCMDs to identify game-changing uses of existing and mature systems and technologies to prepare for presentation to the Cross Functional Teams, and to identify potential missions for the mission management pilot program in accordance with the NDAA for FY 2022.			
FY 2023 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603289D8Z / Advanced Innovative Analysis and Concepts	Project (Number/Name) 329 / Advanced Innovative Analysis and Concepts		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Continue to innovate in partnership with Services Program Offices and CCMDs to identify game-changing uses of existing and mature systems and technologies to prepare for presentation to the Cross Functional Teams.				
FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.				
Title: Quick Win Projects Description: With the establishment of level funding for the Strategic Capabilities Office, and the creation of the Cross Functional Teams to evaluate candidate concepts, the Advanced Innovation Analysis and Concepts Program Element will increase focus on analysis, risk reduction, and formulation for promising future concepts as part of a renewed focus on formulation and risk reduction.		0.625	-	-
Title: Formulation and Risk Reduction Description: Subsequent to review and recommendation of project concepts by the new Technical and Transition Cross Functional Teams, the Strategic Capabilities Office performs engineering trade studies and conducts component tests to prepare selected projects to be ready to enter into full prototype development under the Advanced Innovative Technologies Program Element. Activities, such as proving component and subsystem maturity prior to integration in major systems, are intended to finalize key requirements to reduce technical risk during prototype development. Due to the nature of these projects, specific applications and detailed plans are available at a higher classification level.		13.946	21.412	26.585
FY 2022 Plans: Conduct formulation and risk reduction for five projects reviewed by the Cross Functional Teams and proposed to begin 6.4 work in FY 2023.				
FY 2023 Plans: Conduct formulation and risk reduction for five to six projects reviewed by the Cross Functional Teams and proposed to begin 6.4 work in FY 2024.				
FY 2022 to FY 2023 Increase/Decrease Statement: Budget increases to support increase from five to six new projects in Formulation in FY 2023.				
Accomplishments/Planned Programs Subtotals		28.008	46.351	53.890
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603289D8Z / <i>Advanced Innovative Analysis and Concepts</i>	Project (Number/Name) 329 / <i>Advanced Innovative Analysis and Concepts</i>
D. Acquisition Strategy N/A		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>					PE 0603291D8Z I <i>Advanced Innovative Analysis & Concepts - MHA</i>							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	42.595	14.168	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	56.763
251: <i>SCO Operational Costs</i>	42.595	14.168	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	56.763

Note

New Start (Y/N): No

Funds have been transferred to USRE PE 0603289D8Z in FY 2022.

A. Mission Description and Budget Item Justification

The Strategic Capabilities Office (SCO) conducts analysis to identify and accelerate the development, demonstration, and transition of game-changing capabilities to shape and counter emerging threats and increase the lethality of the Joint Force in contested environments. In a partnership endeavor across the Office of the Secretary of Defense (OSD), Joint Staff, Combatant Commands (CCMDs), the Services, the Intelligence Community (IC), and other U.S. Government agencies, SCO combines capability innovation with new concepts for warfighting that leverage new technology areas, including autonomy, artificial intelligence, and machine learning. SCO conducts projects on accelerated timelines, in all warfighting domains, at any classification or access level.

The Advanced Innovative Analysis and Concepts Program Element supports development, studies, analysis of integrated concepts and prototypes, analysis in support of ongoing efforts to shape and counter emerging threats, cross-Service and cross-Defense/Intelligence concepts, and red-teaming. Projects focus on proving component and subsystem maturity prior to integration in major systems, and may involve risk reduction initiatives. This Program Element also supports the development of concept proposals for assessment by the Technical and Transition Cross Functional Teams established in accordance with the National Defense Authorization Act (NDAA) for FY 2020 for full development under the Advanced Innovative Technologies Program Element. Due to the nature of these projects, specific applications and detailed plans are available at a higher classification level.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603291D8Z / <i>Advanced Innovative Analysis & Concepts - MHA</i>
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B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	14.703	0.000	0.000	0.000	0.000
Current President's Budget	14.168	0.000	0.000	0.000	0.000
Total Adjustments	-0.535	0.000	0.000	0.000	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.003	-			
• SBIR/STTR Transfer	-0.532	-			

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Funds have been transferred to USRE PE 0603289D8Z in FY 2022.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603291D8Z / <i>Advanced Innovative Analysis & Concepts - MHA</i>				Project (Number/Name) 251 / <i>SCO Operational Costs</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
251: <i>SCO Operational Costs</i>	42.595	14.168	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	56.763
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note Funds were transferred to USRE PE 0603289D8Z in FY 2022.												
A. Mission Description and Budget Item Justification The Strategic Capabilities Office (SCO) conducts analysis to identify and accelerate the development, demonstration, and transition of game-changing capabilities to shape and counter emerging threats and increase the lethality of the Joint Force in contested environments. In a partnership endeavor across the Office of the Secretary of Defense (OSD), Joint Staff, Combatant Commands (CCMDs), the Services, the Intelligence Community (IC), and other U.S. Government agencies, SCO combines capability innovation with new concepts for warfighting that leverage new technology areas, including autonomy, artificial intelligence, and machine learning. SCO conducts projects on accelerated timelines, in all warfighting domains, at any classification or access level. The Advanced Innovative Analysis and Concepts Program Element supports development, studies, analysis of integrated concepts and prototypes, analysis in support of ongoing efforts to shape and counter emerging threats, cross-Service and cross-Defense/Intelligence concepts, and red-teaming. Projects focus on proving component and subsystem maturity prior to integration in major systems, and may involve risk reduction initiatives. This Program Element also supports the development of concept proposals for assessment by the Technical and Transition Cross Functional Teams established in accordance with the NDAA for FY 2020 for full development under the Advanced Innovative Technologies Program Element. Due to the nature of these projects, specific applications and detailed plans are available at a higher classification level.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: SCO Operational Costs - MHA									14.168	-	-	
Description: The Strategic Capabilities Office (SCO) conducts analysis to identify and accelerate the development, demonstration, and transition of game-changing capabilities to shape and counter emerging threats and increase the lethality of the Joint Force in contested environments. In a partnership endeavor across the Office of the Secretary of Defense (OSD), Joint Staff, Combatant Commands (CCMDs), the Services, the Intelligence Community (IC), and other U.S. Government agencies, SCO combines capability innovation with new concepts for warfighting that leverage new technology areas, including autonomy, artificial intelligence, and machine learning. SCO conducts projects on accelerated timelines, in all warfighting domains, at any classification or access level. The Advanced Innovative Analysis and Concepts Program Element supports development, studies, analysis of integrated concepts and prototypes, analysis in support of ongoing efforts to shape and counter emerging threats, cross-Service and cross-												

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603291D8Z / <i>Advanced Innovative Analysis & Concepts - MHA</i>	Project (Number/Name) 251 / <i>SCO Operational Costs</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
Defense/Intelligence concepts, and red-teaming. Projects focus on proving component and subsystem maturity prior to integration in major systems, and may involve risk reduction initiatives. This Program Element also supports the development of concept proposals for assessment by the Technical and Transition Cross Functional Teams established in accordance with the National Defense Authorization Act for FY 2021 for full development under the Advanced Innovative Technologies Program Element. Due to the nature of these projects, specific applications and detailed plans are available at a higher classification level.			
Accomplishments/Planned Programs Subtotals		14.168	-
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603338D8Z / <i>Defense Modernization and Prototyping</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	0.000	150.480	96.579	141.561	-	141.561	140.554	143.910	125.091	127.781	-	-
720: <i>Quick Reaction Special Projects (QRSP)</i>	0.000	40.432	49.044	72.316	-	72.316	69.133	70.829	50.275	51.281	-	-
721: <i>Emerging Capabilities Tech Dev (ECTD)</i>	0.000	86.958	47.535	69.245	-	69.245	71.421	73.081	74.816	76.500	-	-
722: <i>Time Sensitive Targeting Defeat (TSTD)</i>	0.000	17.768	-	-	-	-	-	-	-	-	-	-
723: <i>Red Teaming (RT)</i>	0.000	5.322	-	-	-	-	-	-	-	-	-	-

Note

New Start (Y/N): No

In FY 2022, funding for the Time Sensitive Targeting Defeat (TSTD) project transferred to Program Element 0603648D8Z Joint Capability Technology Demonstration (JCTD) for proper alignment and execution.

In FY 2022, the Red Teaming project code transitioned to a focus area under Project Code 721 Emerging Capabilities Technology Development (ECTD).

A. Mission Description and Budget Item Justification

In alignment with the National Defense Strategy, the Defense Modernization and Prototyping (DM&P) Program Element (PE) supports the Under Secretary of Defense for Research and Engineering (USD(R&E)) with innovation-focused prototyping from non-traditional sources that are applicable to Great Power Competition (GPC). Activities focus on early exploration of potentially game-changing emerging technologies and concepts; harnessing small and non-traditional business innovation to address Department of Defense (DoD) challenges; and, mid-term, mission-focused capability development of advanced systems to address DoD modernization needs. DM&P places an emphasis on fully transitioning these innovations and emerging technologies as capabilities to the Services, Combatant Commands (CCMDs), and other end users, with a target transition rate of 80 percent.

Executed in partnership with the Services, Joint Staff, and CCMDs, DM&P programs increase the speed of innovation through the use of an uncharacteristic RDT&E execution model that disburses funding across the four fiscal quarters following receipt of the appropriation. With funds available throughout the year of execution, DM&P enables the USD(R&E) to nurture innovation from small businesses and non-traditional performers, and to accelerate emerging and disruptive technologies. Accordingly, DM&P programs can be responsive and flexible to the DoD and warfighter needs, supporting rapid prototyping to meet immediate capability needs or prototyping game-changing technology for the purposes of GPC. Since program inception in 2006, this atypical execution model has enabled Quick Reaction Special Projects (QRSP) and Emerging Capabilities Technology Development (ECTD) to successfully act as innovation engines for the DoD. This execution model causes the

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603338D8Z <i>I Defense Modernization and Prototyping</i>
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DM&P PE to lag traditional RDT&E PE obligation and execution benchmarks; however, since inception both the QRSP and ECTD programs have achieved an unbroken 100 percent obligation rate.

With an emphasis on joint and interagency partnerships, DM&P project selection is guided by Department-level strategies and priorities, such as the Joint Warfighting Concept, the National Defense Strategy, DoD modernization, and the Combatant Commands' Integrated Priority Lists (IPLs). New projects are selected with inputs from the Services and Agencies, the Joint Staff, the CCMDs, the Strategic Capabilities Office, the Defense Innovation Unit, and other organizations within the DoD innovation ecosystem to deliver capabilities with the widest benefit to the joint warfighter; synchronize prototyping efforts across the DoD; and reduce duplication.

Leveraging innovative ideas from small business and non-traditional performers, academia, government labs, and the industrial base, DM&P funding supports development of risk-reducing joint prototypes to test and validate innovative technologies and concepts. ECTD prototyping projects increase the speed of technology innovation by reducing technology risk for emerging capabilities, enabling innovative developers to showcase new and maturing technologies. By exploring vulnerabilities in emerging technologies, ECTD red teaming activities enable the Department to make informed decisions early in the capability development cycle when design changes are cost effective and programs can be re-directed if developmental dead ends are discovered. QRSP prototypes quickly explore new, higher-risk technology areas, by partnering with small and non-traditional businesses that have the potential for immediate, game-changing impacts. Due to the relatively low average cost of projects, QRSP is able to explore higher-risk opportunities with potentially higher reward.

Completed DM&P projects transition to joint programs and joint warfighters through early operationally relevant prototypes; technology adoption into programs of record; integration into system level, multi-year joint demonstrations; multi-Service joint experiments like the Rapid Defense Experimentation Reserve; and, the Warfighting Lab Incentive Fund for further development of tactics, techniques, procedures (TTPs), and concepts of operation (CONOPs). DM&P targets a transition rate of about 80 percent to strike the optimal balance between pushing technical boundaries, and delivering prototypes with enduring value to the Department.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	155.505	115.443	0.000	-	0.000
Current President's Budget	150.480	96.579	141.561	-	141.561
Total Adjustments	-5.025	-18.864	141.561	-	141.561
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	15.600			
• Congressional Directed Transfers	-	-34.100			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-4.995	-			
• Adjustments to Budget Year	-	-	136.678	-	136.678
• Other Program Adjustments	-0.030	-	4.883	-	4.883
• FFRDC Reduction	-	-0.364	-	-	-

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603338D8Z <i>I Defense Modernization and Prototyping</i>	
<u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u>		FY 2021	FY 2022
Project: 721: <i>Emerging Capabilities Tech Dev (ECTD)</i>			
Congressional Add: <i>Emerging Capabilities Technology Support</i>		7.500	-
Congressional Add: <i>Disruptive Air and Missile Defense</i>		5.000	-
Congressional Add: <i>Open Source Intelligence (OSI)</i>		3.000	3.000
Congressional Add: <i>Remote Advise and Assist (RAA) Technology Development</i>		8.000	-
Congressional Add: <i>Artificial Intelligence Enabled Sensor Network (AIESN)</i>		8.400	-
Congressional Add: <i>Hypersonic Modeling and Simulation Center of Excellence</i>		-	4.600
Congressional Add: <i>Ship-Based Multi-Sensor Prototype Development and Demonstration</i>		-	8.000
Congressional Add Subtotals for Project: 721		31.900	15.600
Project: 722: <i>Time Sensitive Targeting Defeat (TSTD)</i>			
Congressional Add: <i>Stratospheric Balloon Research</i>		10.000	-
Congressional Add Subtotals for Project: 722		10.000	-
Congressional Add Totals for all Projects		41.900	15.600
<u>Change Summary Explanation</u>			
FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.			
\$4.883 million FY 2023 Program Adjustment is an economic assumption inflation increase. \$34.100 million Congressional Directed Transfer in FY 2022 realigns funds from Project 721 to Program Element 0604331D8Z Rapid Prototyping Program (RPP) for execution of the Rapid Defense Experimentation Reserve (RDER).			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603338D8Z / <i>Defense Modernization and Prototyping</i>				Project (Number/Name) 720 / <i>Quick Reaction Special Projects (QRSP)</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
720: <i>Quick Reaction Special Projects (QRSP)</i>	0.000	40.432	49.044	72.316	-	72.316	69.133	70.829	50.275	51.281	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

QRSP funds the development of risk-reducing prototypes to expedite delivery of effective, affordable, and critically needed technologies and warfighting concepts that maintain the Department's advantage against peer and near-peer competitors. These lower-cost prototypes and QRSP's innovative business processes give the Under Secretary of Defense for Research and Engineering (USD(R&E)) the agility to quickly explore new disruptive technology areas that have the potential for immediate, game-changing impacts. QRSP also enables the Department of Defense (DoD) to identify innovative solutions from small and non-traditional businesses not normally engaged by the DoD to address gaps and identify emerging technology trends. Providing innovative small and non-traditional businesses the opportunity to engage with various government audiences enables the DoD to quickly harness innovative solutions that could solve DoD challenges. Project selection is guided by department-level strategies and priorities, such as the Joint Warfighting Concept, the National Defense Strategy, and DoD's modernization areas. Needs are identified and prototype projects are funded throughout the year of execution to demonstrate the feasibility of new technologies, enable integration into larger systems, and deliver affordable capabilities faster than standard acquisition cycles. With an emphasis on joint and interagency partnerships, QRSP matures capability options to anticipate and inform new acquisition pathways in addition to formal requirements and acquisition processes. Investing in high risk/high reward concepts, QRSP projects are typically phased with clear developmental milestones. This approach enables QRSP to rapidly mature innovative technologies; quickly identifying technological dead ends and prioritizing investment in projects demonstrating results. Individual projects generally span twelve to twenty-four months and typically at a cost of less than \$1.000 million per phase.

Recent success stories and significant transitions of note include:

- Virtual Raptor developed a suite of artificial intelligence (AI)-based tools to perform data analysis. Virtual Raptor's tools can identify, visualize, and share phenomena, anomalies, and patterns in large and complex sets of mission data. The program successfully transitioned to the U.S. Air Force and U.S. Special Operations Command.
- Smart Sensor is an autonomous sensor platform that significantly accelerates the time it takes to conduct object identification, target recognition, and placement of effects on target tasks. The Smart Sensor capability successfully transitioned to the U.S. Air Force.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Low Cost Innovative Projects (Projects less than \$1.000 million dollars per phase)	18.507	3.340	-
Description: Investing in high risk/high reward concepts, QRSP projects are typically phased with clear developmental milestones. This approach enables QRSP to rapidly mature innovative technologies; quickly identifying technological dead ends and prioritizing investment in projects demonstrating results. Individual projects generally span twelve to twenty-four months and at a cost of less than \$1.000 million per phase. In FY 2021, QRSP selected, executed, and transitioned multiple low cost projects, including:			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603338D8Z / <i>Defense Modernization and Prototyping</i>		Project (Number/Name) 720 / <i>Quick Reaction Special Projects (QRSP)</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> • Compact Micro-Electromechanical Systems (MEMS) LiDAR: This project developed and demonstrated a low-size, weight, and power (SWaP), MEMS LiDAR prototype to provide enhanced battlefield situational awareness for autonomous systems. The prototype transitioned to the Defense Threat Reduction Agency (DTRA). • Next Generation Imagers: This project prototyped a novel charge-coupled-device imager providing enhanced spectral and interface performance for surveillance applications. Development of the prototype capability will continue in FY 2022 with final transition to the U.S. Space Force and the National Aeronautics and Space Administration. • High Performance Solid Rocket Propellant: This project developed a novel, aluminum-lithium alloy to be evaluated as a fuel in solid rocket propellant. This new ingredient could increase munition performance, and removes a dangerous emission common in alternative formulations. This project transitioned to the U.S. Army. • Jaded Unicorn: This project developed and demonstrated an innovative electronic-warfare capability, easily deployable on existing platforms, to address modern challenges. The capability successfully transitioned to the U.S. Army, U.S. Navy, and U.S. Air Force. • SATURN Waveform: This project developed and demonstrated prototype waveforms for Second-generation Anti-jam Tactical Ultra High Frequency (UHF) Radio for NATO (SATURN) transceivers, used by the DoD and North Atlantic Treaty Organization (NATO) Partners. The waveforms offer increased anti-jam performance in contested environments, for effective Fully Networked Command, Control and Communication (FNC3). Development of the prototype capability will continue in FY 2022 with final transition to the Services through the U.S. Air Force. • Arcadia: This project is developing and demonstrating a prototype, low-SWaP, radio-frequency (RF) transceiver, leveraging a Modular Open System Approach (MOSA) architecture. Development of the prototype capability will continue in FY 2022 with final transition to the U.S. Air Force. • CAROUSEL: This project performed rapid analysis, modeling, and simulation to identify opportunities to optimize DoD multi-domain targeting systems. The results transitioned to the Services and Combatant Commands (CCMDs) to inform future development. • Global IoT Data Exploitation on the Network (GIDEON): This project developed and demonstrated a prototype for discovery, classification, and analysis of Internet of Things (IoT) devices to enhance warfighter situational awareness. The prototype transitioned to the U.S. Army. • Advanced Electronic Warfare (EW): This project developed a cohesive end-to-end EW technology designed to attack priority threat systems. The prototype transitioned to the U.S. Navy. • Intelligent Power Distribution System: This project prototyped an intelligent power distribution unit leveraging AI/ML to reduce power grid failures. This project transitioned to the U.S. Army. • Vulnerability Analysis and Testing Tools: This project developed a software toolset that allows the warfighter to rapidly identify cyber vulnerabilities. The project transitioned to the U.S. Navy and U.S. Marines Corps. 					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603338D8Z / <i>Defense Modernization and Prototyping</i>		Project (Number/Name) 720 / <i>Quick Reaction Special Projects (QRSP)</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> • Advanced Off-board Payload: This project developed and successfully demonstrated an advanced payload prototype for use in off-board expendables. This prototype transitioned to the U.S. Air Force and U.S. Navy. • Autonomous Dynamic Control for Improved Intelligence, Surveillance, and Reconnaissance (ADCII): This project developed and demonstrated new sensing and target verification techniques for applications at the tactical-edge. This project transitioned to the Joint AI Intelligence Center (JAIC) Smart Sensor Program. • Bullseye: This project developed and demonstrated novel web-based tools to significantly reduce the targeting time line. Development of the prototype capability will continue in FY 2022 with final transition to the U.S. Air Force and joint partners. • Tactical Identification System: This project developed and demonstrated a compact, cellular phone or ATAK chassis compatible Raman spectrometer that rapidly identifies unknown chemical substances. The prototype transitioned to the U. S. Special Operations Command (USSOCOM). • Interpretable Machine Learning for Adversarial Attack Detection and Mitigation: This project developed autonomy algorithms to enhance operator decision making when mitigating cyber-attacks. Development of the capability will continue in FY 2022 with final transition to the U.S. Navy. • Non-Traditional Sensors: This project developed a novel method to leverage payloads as non-traditional sensors. This project transitioned to the U.S. Navy. • Over the Firewall Horizon Cyber Defense: This project developed a novel cyber sensing and analysis capability to detect malicious cyber activity in advance of an actual attack. This capability transitioned to DoD and interagency partners. • Millimeter-Wave Signal Processor (MMWSP): This project developed a microwave subsystem comprising a high-performance integrated circuit (IC) and associated control electronics to enhance traditional radio frequency (RF) front ends. This project successfully transitioned to the U.S. Navy. • Advanced Security Tag: This project is a novel capability to mark, scan, and catalog military components that will be used to track and control inventories while eliminating or mitigating the risks associated with parts tracking, quality control, and security management within maintenance and operational chains. This project successfully transitioned to the U.S. Navy. • Weapon System Virtual Reality (VR): This project executed risk reduction activities on new low-cost standalone VR headsets and cloud-based computing to inform the development of virtual training for pilots and aircrew. This capability will optimize flight training, and reduce flight hours and full-scale simulator training time. The project transitioned to the U.S. Air Force. • High Performance Propulsion System for Picosatellites: This project prototyped an innovative, low-cost nanoscale electrospray propulsion system that provides high thrust density for small satellites. Development of the prototype capability will continue in FY 2022 with final transition to multiple U.S. Government agencies. • Smart Probe: This project developed new tools and software for executing a novel approach to protocol modeling and analysis. This project successfully transitioned to the U.S. Navy and interagency partners. • Red Claw: This project developed and demonstrated the capability to detect, classify, locate, and track signals of interest. The capability transitioned to the U.S. Navy, U.S. Army, and USSOCOM. 					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603338D8Z / <i>Defense Modernization and Prototyping</i>	Project (Number/Name) 720 / <i>Quick Reaction Special Projects (QRSP)</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>• Enhanced Low Resource Language Identification: This project developed novel tools and algorithms to identify low-resource/low-density languages in austere environments. This technology successfully transitioned to DoD agencies in support of U.S. Africa Command.</p> <p>FY 2022 Plans: In FY 2022, QRSP will complete execution and transition the following low cost projects:</p> <ul style="list-style-type: none"> • Next Generation Imagers: Development of the prototype capability will continue in FY 2022 with final transition to the U.S. Space Force and the National Aeronautics and Space Administration. • SATURN Waveform: Development of the prototype capability will continue in FY 2022 with final transition to the Services through the U.S. Air Force. • Arcadia: Development of the prototype capability will continue in FY 2022 with final transition to the U.S. Air Force. • High Performance Propulsion System for Picosatellites: Development of the prototype capability will continue in FY 2022 with final transition to multiple U.S. Government agencies. • Interpretable Machine Learning for Adversarial Attack Detection and Mitigation: Development of the capability will continue in FY 2022 with final transition to the U.S. Navy. • Bullseye: Development of the prototype capability will continue in FY 2022 with final transition to the U.S. Air Force and joint partners. <p>FY 2022 to FY 2023 Increase/Decrease Statement: The respective phase 2 projects will be completed in FY 2022.</p>			
<p>Title: Intelligent Sensing for Remote and Field Care (IS4RFC)</p> <p>Description: The IS4RFC project is prototyping an innovative ultrasound imaging system to enhance small unit medical self-sufficiency at the tactical edge in support of future distributed warfighting concepts such as the Army Multi-Domain Operations (MDO) and the USMC Expeditionary Advanced Base Operations (EABO). These concepts involve units separated by large geographic distances, operating in austere environments with area denial challenges which necessitate the need for intelligent medical devices that support trauma care in the field by overwhelmed or inexperienced care providers. Access to imaging systems at the tactical edge is a critical enabler, providing combat medical personnel with a new and more accurate tool to diagnose and triage the wounded. The IS4RFC project develops and demonstrates an innovative distributed aperture, high-precision 3D volume ultrasound imaging system that is easy-to-use, with drastically reduced cost and space, weight, and power (SWaP). In FY 2021, the prototype design of the integrated circuit (IC) was completed and work began to develop the initial benchtop prototype.</p> <p>FY 2022 Plans:</p>		1.000	1.000
			-

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603338D8Z / <i>Defense Modernization and Prototyping</i>	Project (Number/Name) 720 / <i>Quick Reaction Special Projects (QRSP)</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
In FY 2022, the design and development of the MEMS transducer and the initial engineering tests of the integrated circuits (IC) will be completed. The team will complete the integration of the IC, MEMS transducer, and supporting ultrasound into an integrated prototype comprised of two-to-four imaging tiles with supporting circuitry to combine individual imaging tile data into one combined 3D image.			
FY 2022 to FY 2023 Increase/Decrease Statement: This project will transition to the U.S. Army and U.S. Special Operations Command (USSOCOM) in FY 2023.			
Title: Tactical Grade-Inertial Measurement Unit (TG-IMU) Description: The TG-IMU project developed and demonstrated a millimeter-scale, tactical grade IMU providing a 1,000 times reduction in volume and 10,000 times reduction in power compared to existing IMUs. The TG-IMU enables improved navigation in GPS-contested environments for small caliber munitions such as the Army Precision Guidance Kit-Anti-Jam (PGK-AJ), XM1155, and Excalibur HTK. In FY 2021, the project successfully demonstrated a low power ASIC and a six degree of freedom microelectromechanical system (MEMS) chip operating together to provide near tactical grade inertial performance. The Tactical Grade IMU project transitioned to the U.S. Army for further development and integration into their selected platforms.		1.500	-
Title: Automated Mitigation of Disinformation Amplifiers (AMDA) Description: The AMDA project developed and demonstrated a novel capability to counter Internet of Things (IOT)-based botnets relevant to Great Power Competition at scale by applying recent technology breakthroughs in automated vulnerability analysis. By targeting botnets that are being used to amplify disinformation messages, AMDA, in coordination with other government agencies, will provide a means of combating disinformation at scale. In FY 2021, AMDA completed the development of a proof-of-concept system for automating vulnerability research and transitioned to U.S. Air Force developers.		1.575	-
Title: Enhanced Geo-Registration for Edge Targeting Support (EGETS) Description: The EGETS project will develop a containerized Electro-optical (EO) and Infrared (IR) still imagery auto-mensuration and EO Full Motion Video (FMV) geo-registration software capability that is deployable to multiple target platforms. The system will demonstrate the ability to perform real-time precision geo-registration capabilities at the tactical edge. In FY 2021, the project developed a containerized capability that is deployable in multiple environments, including for tactical edge users. Tactical forces will be able to use imagery data in real-time for time-critical mission needs without requiring time-intensive reach back processing in the National System for GEOINT (NSG) enterprise, while also supporting enterprise users with reach-back.		1.000	1.000
FY 2022 Plans:			-

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B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Work continues in FY 2022, to demonstrate EGETS's ability to perform real-time precision geo-registration capabilities at the tactical edge.					
FY 2022 to FY 2023 Increase/Decrease Statement: This project will transition to the U.S. Air Force, National Geospatial-Intelligence Agency, and DTRA in FY 2023.					
Title: The Gates Description: This is a classified program. Additional information is available upon request. FY 2022 Plans: This is a classified program. Additional information is available upon request. FY 2022 to FY 2023 Increase/Decrease Statement: The Gates will be completed in FY 2022.			1.500	1.500	-
Title: Project 2106 Description: This is a classified program. Additional information is available upon request. FY 2022 Plans: This is a classified program. Additional information is available upon request. FY 2022 to FY 2023 Increase/Decrease Statement: Project 2106 activities will be completed in FY 2022.			1.300	0.700	-
Title: Tactical Agency Capability - Human/Machine Team (TAC-H) Description: TAC-H is developing human-machine collaborative decision making tools to provide Special Operations Forces (SOF) units with faster-than-human response to threats. As battlefield environments become more complex and lethal the joint force requires capabilities which reduce cognitive burden and accelerate decision making by leveraging autonomous platforms and human-machine collaborative systems at the tactical edge. TAC-H will develop and demonstrate a real time decision making engine fusing disparate data sources and providing the warfighter recommended Courses of Action (COAs) based on the current operating environment. In FY 2021, the project completed the preliminary design review for the software components and conducted initial tests to improve the accuracy/efficiency of the software. FY 2022 Plans:			1.050	1.050	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
In FY 2022, the TAC-H project plans to complete the development of the software package and will integrate it with the TAC-H hardware to conduct laboratory and field testing to validate the hardware and software system performance.			
FY 2022 to FY 2023 Increase/Decrease Statement: In FY 2023, the TAC-H project will transition to the United States Army Special Operations Command (USASOC).			
Title: Direct to Retina AR/VR Eyewear Description: The Direct to Retina project is developing the first and only Augmented Reality/Virtual Reality (AR/VR) eyewear glasses that will directly project images right onto the retina. This revolutionary technology will replace current day mixed reality technology which requires O-LED screens, heavy head gear, and bulky lenses. By directly projecting the image onto the retina, the operator will have complete 220 degrees' field of view, infinite depth of view, reduction in lag time, and increase battery life to at least ten hours of consistent usage. In FY 2021, the project completed the design and fabrication of the initial prototype components. FY 2022 Plans: In FY 2022, the Direct to Retina project will to continue to mature and test an operational prototype. FY 2022 to FY 2023 Increase/Decrease Statement: In FY 2023, the prototype will transition to a formal Program of Record within the U.S. Air Force Education and Training Command.		1.000	1.000
Title: Autonomy at the Tactical Edge Focus Area Description: This focus area explores technologies and capability concepts to enhance the lethality of the joint force, reduce the time to make critical decisions, autonomously distribute tasking and orders, and protect warfighters through increased use of intelligent networks, autonomous sensing platforms, and human-machine collaborative systems. Selected projects target key capabilities that enable leap-ahead improvements and intelligent autonomous systems with cost effective investments. These projects leverage advances in high performance computing, autonomy, and machine learning to transfer cognitive burden closer to the point of collection and action. Examples include agile computer vision systems; enhanced capabilities for multiple autonomous systems to cooperatively interact; tools to fuse and infer information from a wide variety of sensors and datasets; autonomous task discrimination and prioritization; autonomous operation in complex terrain; collaborative systems for efficient distribution of contested logistics; data preprocessing to reduce bandwidth requirements for fully integrated command and control; and human-machine collaborative decision making providing faster-than-human response to threats. These projects will also examine common software platforms and modular open architecture systems to reduce development cost, increase collaboration among manned and unmanned platforms, and inform requirements. FY 2022 Plans:		-	12.000

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>QRSP investment decisions are made during the execution year in response to DoD, CCMD, Service, and other government priorities. QRSP anticipates supporting eight to twelve projects in FY 2022.</p> <p>FY 2023 Plans: QRSP investment decisions are made during the execution year in response to DoD, CCMD, Service, and other government priorities. QRSP anticipates supporting thirteen to sixteen projects in FY 2023.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding for this focus area in FY 2023 increases to support acceleration of high priority autonomy prototyping efforts.</p>			
<p>Title: Targeted Prototyping for Increased Lethality and Survivability Focus Area</p> <p>Description: This focus area leverages opportunities for collaboration to rapidly mature and demonstrate advanced weapon systems through targeted prototyping of key enabling technologies. Selected projects extend Service and Defense Agency investments partnering with U.S. Special Operations Command (USSOCOM), Defense Innovation Unit (DIU), Service Rapid Capability Offices, Service laboratories, and other organizations that seek to mature technologies and future capabilities through near-term operational concepts. Example projects include dynamic data links for re-tasking and coordination of small munitions; new propellant formulations for extended range fire support; advanced materials to increase weapon system survivability; novel warhead designs to increase lethality; and low cost, extended range, swarming, loitering munitions. Through co-funding and invested transition partners, developed concepts will be rapidly deployed to assess utility and inform concepts of operation prior to initial operation, and to inform future acquisition programs.</p> <p>FY 2022 Plans: QRSP investment decisions are made during the execution year in response to DoD, CCMD, Service, and other government priorities. QRSP anticipates supporting seven to ten projects in FY 2022.</p> <p>FY 2023 Plans: QRSP investment decisions are made during the execution year in response to DoD, CCMD, Service, and other government priorities. QRSP anticipates supporting thirteen to seventeen projects in FY 2023.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding for this focus area in FY 2023 increases to support acceleration of high priority prototyping efforts.</p>		-	5.601
<p>Title: Persistent Intelligence, Surveillance and Reconnaissance (ISR) Focus Area</p> <p>Description: ISR sensor networks are critical for providing an asymmetric advantage against peer adversaries. Advances in distributed, interconnected sensors with fully networked command, control, and communications provide opportunities for new solutions to anti-access/area denial and persistent surveillance challenges. This focus area addresses emerging needs for persistent ISR capabilities, which provide improved ground, air, sea, and space situational awareness. Projects will mature</p>		-	5.166
			12.498
			10.820

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B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
technologies and future capability concepts by developing platforms, sensors, and communication architectures that explore new or improved methods for robust, ad-hoc sensors networks; reliable communications; and collaboratively networked sensors to persistently operate within denied areas.					
FY 2022 Plans: QRSP investment decisions are made during the execution year in response to DoD, CCMD, Service, and other government priorities. QRSP anticipates supporting seven to ten projects in FY 2022.					
FY 2023 Plans: QRSP investment decisions are made during the execution year in response to DoD, CCMD, Service, and other government priorities. QRSP anticipates supporting eleven to fourteen projects in FY 2023.					
FY 2022 to FY 2023 Increase/Decrease Statement: Funding for this focus area in FY 2023 increases to support acceleration of high priority persistent ISR prototyping efforts.					
Title: Realizing Disruptive Technologies for DoD Modernization Focus Area			-	6.456	15.500
Description: This focus area matures key capabilities that augment platforms, weapons, sensors, and other solutions to modernization challenges. Selected projects leverage investment from traditional and non-traditional industry partners; proven commercial- and government- off-the-shelf technologies; rapidly maturing technologies within Service laboratories, academia, and Federally Funded Research and Development Centers (FFRDCs); technologies from allied nations; and direct warfighter feedback to identify and address gaps within current and developing capabilities. These targeted investments accelerate capabilities to the warfighter and realize new disruptive technologies through low cost, rapid innovation within the development process of major system prototypes through the Strategic Capabilities Office, Defense Innovation Unit, and Service programs of record. Example projects include novel learning algorithms and next generation computing; adaptation of commercial cyber tools; proof of concept demonstrations of quantum sensors; unique applications of active and passive radio frequency architectures; and, early-stage concepts for highly-efficient directed energy subsystems.					
FY 2022 Plans: QRSP investment decisions are made during the execution year in response to DoD, CCMD, Service, and other government priorities. QRSP anticipates supporting eight to twelve projects in FY 2022.					
FY 2023 Plans: QRSP investment decisions are made during the execution year in response to DoD, CCMD, Service, and other government priorities. QRSP anticipates supporting sixteen to twenty projects in FY 2023.					
FY 2022 to FY 2023 Increase/Decrease Statement:					

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
Funding for this focus area in FY 2023 increases to support acceleration of high priority prototyping efforts.			FY 2023
Title: Distributed, Collaborative, Multi-Function Devices for Electromagnetic Spectrum Agility Focus Area Description: This focus area explores integrated, multi-function, net-centric electromagnetic spectrum (ES) concepts and technologies to enable a multi-domain, flexible, diverse, and interoperable ES architecture. In the modern battlespace, the ES is both a contested resource and unique domain requiring advanced maneuver. Tactics, techniques, and procedures are necessary to maintain access to ES and ensure maneuverability. Selected projects provide the architecture to ensure allied access, deny enemy use, and enable future capabilities for ES dominance. Examples include waveform agnostic apertures, amplifiers, and digital signal processing for multi-use systems (radar, communications, electronic warfare, sensing); advanced routing and artificial intelligence task and network routing for increase efficiency; and, ad hoc distributed apertures for collaborative electronic warfare (EW) distributed radar. Activities include refining software and algorithms; novel hardware and electronic components; and advanced timing and networking technologies that directly support emerging common standards for next generation distributed, collaborative, and multi-function devices. FY 2022 Plans: QRSP investment decisions are made during the execution year in response to DoD, CCMD, Service, and other government priorities. QRSP anticipates supporting seven to ten projects in FY 2022. FY 2023 Plans: QRSP investment decisions are made during the execution year in response to DoD, CCMD, Service, and other government priorities. QRSP anticipates supporting fourteen to eighteen projects in FY 2023. FY 2022 to FY 2023 Increase/Decrease Statement: Funding for this focus area in FY 2023 increases to support acceleration of high priority prototyping efforts.		-	5.555
Title: Multi-domain Experimentation and Demonstration Venues Description: Agile and flexible experimentation and demonstration venues for innovation discovery enable DoD to rapidly discover nascent novel technologies and emerging capabilities, particularly from small businesses and non-traditional performers. Leveraging a streamlined multi-domain process enables system developers to engage directly with the warfighter supporting the rapid discovery and transition of emerging technologies to Services, Defense Agencies and Combatant Command users. In FY 2021, 13 demonstration and early experimentation events were conducted featuring 223 innovative technologies from focus areas including autonomous technologies, virtual reality, machine learning, signature management, and cybersecurity. 105 of the technologies transitioned directly to DoD operational users or were leveraged by formal programs of record, including U.S. Army Maneuver Support Vessel (light) and U.S. Marine Corps (USMC) Amphibious Combat Vehicle. The venues also provided		5.000	5.000
			13.498

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
68 small businesses and non-traditional innovators with warfighter feedback critical to rapidly mature their technologies into viable prototypes.			
FY 2022 Plans: Building on previous experience, six to eight demonstrations to accelerate innovation are planned for FY 2022. These demonstrations will focus on contested logistics, joint fires, information advantage, and fully networked command and control technologies. Capabilities evaluated will include: multimodal antenna systems; multi-domain autonomous systems; red teaming resilient networks; and, other priorities identified through engagement with stakeholders.			
FY 2023 Plans: Building on previous experience, six to eight demonstrations to accelerate innovation are planned for FY 2023. These demonstrations will focus on contested logistics, joint fires, information advantage, and fully networked command and control technologies. Capabilities evaluated will include: fully autonomous logistics systems; resilient command control networks for fires and secure communications in the denied environment; and, other priorities identified through engagement with stakeholders.			
Title: Strategic Multi-Layered Assessment (SMA) Reach Back Cell Description: The SMA Cell supports senior leadership in the Combatant Commands (CCMDs) with actionable assessments of complex operational and technical challenges. SMA efforts leverage multi-agency, multi-disciplinary approaches to answer the Combatant Commanders' key strategic questions that are not within the DoD's core competency. The assessments help maintain our competitive advantage in an increasingly complex global environment. The SMA Cell was established by the Joint Staff Deputy Director for Global Operations at the request of the Commander, U.S. Central Command (USCENTCOM). SMA assessments are framed during the year of execution and are in response to specific tasking from senior leadership in the CCMDs. The SMA Cell identifies options from across the U.S. Government, academia, and the private sector. SMA efforts are facilitated by the Joint Chiefs of Staff/J-3 Operations and are executed by the Office of the Under Secretary of Defense, Research and Engineering. The SMA Cell provides USCENTCOM with population-based and regional expertise in support of ongoing operations in the USCENTCOM area of responsibility.		4.000	2.000
FY 2022 Plans: SMA will continue to actively work with the CCMDs and the Joint Staff to identify challenging problems that are not within the traditional areas of DoD expertise. These problems will be in direct support of CCMD senior leadership.			
FY 2022 to FY 2023 Increase/Decrease Statement: Funding for the SMA Reach Back Cell is realigned to support the development of hardware and software prototypes that address the Joint Warfighting Concepts and other DoD priorities.			
Title: Prototyping Through Non-Traditional Pathways		3.000	3.000

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>Description: Prototyping Through Non-Traditional Pathways leverages technologies and emerging products developed by small, innovative businesses in the commercial sector including information technologies; internet-of-things sensors and adaptive networks; bio-medical advances; emerging quantum applications; and novel microelectronic/microelectromechanical system innovations. Ideas from non-traditional emerging technology companies are matched against DoD, Combatant Command, Service, and other government priorities. Promising solutions are selected for further test and evaluation and, if successful, rapid prototyping or fielding to transition commercial ideas with military utility. These efforts support the Department's objectives of leveraging commercial innovation to maintain technology superiority; increasing rate of technology maturation; exploring alternative and faster pathways for acquisition; and fielding affordable and effective joint mission capabilities.</p> <p>FY 2022 Plans: Prototyping Through Non-Traditional Pathways anticipates four to six reviews in FY 2022 with 20 to 25 resulting evaluations with potential for future prototypes. Each review focuses on identifying ideas in a specific topic area that can transition to meet joint operational needs through rapid prototyping. These reviews will be executed with DoD users and interagency partners.</p> <p>FY 2023 Plans: Prototyping Through Non-Traditional Pathways anticipates four to six reviews in FY 2023 with 20 to 25 resulting evaluations with potential for future prototypes. Each review focuses on identifying ideas in a specific topic area that can transition to meet joint operational needs through rapid prototyping. These reviews will be executed with DoD users and interagency partners.</p>			
Accomplishments/Planned Programs Subtotals		40.432	49.044
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
Quick Reaction Special Projects (QRSP) will support FY 2023 performance metrics to transition projects to the joint warfighter and enable DoD modernization capabilities.			

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Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603338D8Z / Defense Modernization and Prototyping				Project (Number/Name) 721 / Emerging Capabilities Tech Dev (ECTD)			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
721: Emerging Capabilities Tech Dev (ECTD)	0.000	86.958	47.535	69.245	-	69.245	71.421	73.081	74.816	76.500	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

ECTD funding supports the Under Secretary of Defense for Research and Engineering (USD(R&E)) mission to accelerate the development and fielding of overmatch capabilities to the warfighter by rapidly identifying and exploiting emerging technologies that are relevant to Great Power Competition (GPC). Prototyping activities focus on achieving capabilities required to implement the Joint Warfighting Concept, the National Defense Strategy, and meet key Defense modernization challenges in mission areas identified by the Joint Staff and USD(R&E) leadership. ECTD prototype activities enable developers to showcase new and maturing capabilities in realistic environments and against realistic threats with operational user involvement. Executed in close coordination with the Services, Combatant Commands (CCMDs), and Joint Staff, ECTD activities refine future warfighting concepts; inform Service program of record (PoR) capability requirements; and, provide residual joint warfighting capability through leave-behind prototypes.

Anticipated FY 2023 investments areas target the following key mission areas: Contested Logistics Operations; Advanced Electronic Warfare (EW); Fully Networked Command, Control, and Communication (FNC3); Joint Fires and Targeting; and Intelligence, Surveillance, and Reconnaissance (ISR) to support Time-Critical Targeting. Projects are identified through concepts received from the Services, CCMDs, industry, academia, Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Centers (UARCs), and Department of Defense (DoD) laboratories. Efforts are designed to encourage teaming between organizations to generate integrated concepts that result in leap-ahead warfighting capabilities. This process also focuses related Service and Defense Agency projects to a common set of gaps addressing peer engagements. Individual projects generally span two to three years, typically at a cost of less than \$15.000 million.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Fully Networked Command, Control, and Communications (FNC3) Universal Command & Control (UC2)	28.033	5.000	-
Description: UC2 will provide an interface that enables future commanders to dynamically connect any sensor in any domain to any shooter. The FNC3 UC2 project addresses a Secretary of Defense priority for integrated communications and networking. By focusing on a DoD-wide standard for the data layer of machine-to-machine (M2M) Command and Control (C2), the project will develop and demonstrate an efficient, evolvable, and broadly applicable standard to increase the interoperability, flexibility, and resiliency of FNC3 systems. Aligned with the Joint All-Domain Command & Control (JADC2) concept, UC2 compliant systems will dynamically respond by forming new systems and system combinations to address unanticipated, asymmetric, and evolving threats. The FNC3 UC2 project will provide warfighters faster access to new capabilities, while simplifying development and sustainment life cycles, and lower operating and training costs. In FY 2021, development of the UC2 language and functional architecture continued forward towards the major version release 2.0. Initial implementation, unit testing, and integration activities to incorporate the UC2 standard into Service systems was completed. The initial phase of the UC2 project culminates			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
in an integrated, Joint-Service experiment planned for early FY 2022, which will assess the individual and interconnected performance of the UC2-adapted technologies and capabilities now resident within participating Service systems in a testing range environment.			
FY 2022 Plans: Building on the early FY 2022 experiment results, the UC2 standard language and functional architecture will continue to be iteratively refined to enable further integrated, Joint-Service experimentation more closely associated with an operationally relevant environment.			
FY 2022 to FY 2023 Increase/Decrease Statement: In FY 2023, the UC2 project transitions to the Services for further development and integration.			
Title: High-Altitude Optical Reconnaissance Unit and Sensor (HORUS)		10.000	-
Description: HORUS is a prototype electro-optical/infrared system incorporating a modular open system architecture to provide an adaptable and evolvable capability. The HORUS prototype supports day or night operations providing multi-spectral, high-definition full motion video from extreme slant ranges. In FY 2021, fabrication of the two prototype HORUS units started. Work continues in FY 2022 using FY 2021 funds to complete prototype fabrication and testing prior to transitioning to U.S. Special Operations Command (USSOCOM) for final evaluation and operational use.			-
Title: Mission Engineering for Optimized Warfighting		3.000	-
Description: Mission Engineering for Optimized Warfighting leverages modeling and simulation, wargaming, intelligence forecasts, mission design, and system engineering activities to refine Mission Prototyping Concepts to the Joint Warfighting Concept. Mission Engineering for Optimized Warfighting deconvolves Joint Warfighting Concepts into core capabilities assessing how each capability provided by a Mission Prototyping Concept aligns to achieve the overall mission objective. In FY 2021, analysis was completed on multiple promising concepts to refine system requirements and inform investment decisions for prototyping concepts.			-
Title: FNC3 Communications & Networking Infrastructure (C&NI) Broad Area Announcement (BAA) Task Area #3		5.950	-
Description: This project executes prototyping activities to mature communication concepts that enable multi-domain communications. Prototyping activities focus on increasing communications resiliency to tactical and strategic assets. Prototype systems will inform the development of Service-specific solutions required to provide fully-networked, command, control, and communications (FNC3). In FY 2021, engineering studies for two concepts were completed prior to down-selection to single prototype concept. Maturation of the system design and initial prototype development was initiated in late FY 2021. Prototype			-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
development transitions to the U.S. Navy in FY 2022 to complete prototype development and demonstration by FY 2025. Additional details are classified.			FY 2023
Title: Polar Skywave Radar (PSR) Description: PSR directly supports the National Defense Strategy's priority for increased lethality through persistent long range sensors to address the limitations of the current North Warning Systems and emerging threats. PSR matures radio frequency (RF) hardware and advanced radar processing algorithms to validate that over-the-horizon skywave radar is viable for a future surveillance system in the polar region. PSR focused on ten major tasks to extend skywave radar to the polar region including deployment of high frequency (HF) radar hardware for a scaled model and refinement of signal processing techniques. In FY 2021, PSR initiated efforts for expansion of the scaled model system to support higher fidelity testing and validation. Antenna arrays were enlarged and supporting components (amplifiers, receivers, sounder system) prepared for deployment. Performance prediction software models were compared to collected data for model verification and improvement. FY 2022 Plans: In FY 2022, PSR will complete system expansion to four times the initial size. Data collections will begin in the Spring, with additional collections in Summer and Fall. Adaptive algorithms will be tested and improved against collected data. Results will be incorporated into physics based and empirical models to enable operational performance predictions. FY 2022 to FY 2023 Increase/Decrease Statement: In FY 2023, PSR transitions to the U.S. Air Force Life Cycle Management Center (AFLCMC) for further development.		0.500	1.800
Title: Flying Self Emplacement Sea Glider (FSG) Unmanned Undersea Vehicle (UUV) Description: The FSG UUV merges two distinct unmanned systems: unmanned undersea vehicles (UUVs) and unmanned air vehicles (UAVs) resulting in a hybrid unmanned system capable of autonomous flight followed by transition to underwater operation. Flying emplacement allows these UUVs to avoid adverse ocean currents and long transit times to arrive at a needed location quickly, and without the logistic burden of a traditional manned deployment. Leveraging a novel Naval Research Laboratory (NRL) design, the FSG UUV will demonstrate this new capability to rapidly deploy undersea vehicles for a wide range of scientific and operational applications. This effort includes vehicle operation with a newly developed multi-mode avionics suite capable of command and control in both operating regimes, new power management architecture, and representative payloads. In FY 2021, a new avionics suite was integrated into the existing vehicles and the new multi-mode vehicle was vetted through a series of tests to include flights and swims up to and including a full weight flight to water landing. FY 2022 Plans:		0.925	1.075

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>Building on the initial series of flights and swims, further development and integration will be completed to optimize system performance, and to integrate a representative payload. In late FY 2022, prototype development will complete, transitioning to the U.S. Navy for a FY 2023 operational demonstration to validate system performance in an operationally relevant environment.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Development of the FSG UUV prototype completes in FY 2022 prior to transitioning to the U.S. Navy for further development and integration.</p>			
<p>Title: Echelon</p> <p>Description: This project will develop a common digital twin technical framework capable of supporting a wide variety of military RF systems. Echelon will support virtual testing of digital twin prototypes, enabling the Department of Defense to evaluate the effectiveness of prototype systems or subsystems in realistic environments and against red threats early in development. The developed high-fidelity multi-physics framework/testbed will enable Service research and acquisition programs to mature digital twin prototypes prior to purchasing extensive hardware enabling programs to shorten the development lifecycle of current system upgrades and next generation systems. This effort includes the hardware and software implementation of the first instantiation of the Echelon technical framework. During FY 2021, the Echelon project completed use case definitions, requirements derivation, and assessed/identified available tools to be leveraged for the digital twin framework baseline. In addition, the Echelon project established an initial model based systems engineering (MBSE) model for the project. This MBSE model will evolve as the digital twin framework is further developed in FY 2022 and FY 2023.</p> <p>FY 2022 Plans: Building on the initial MBSE Echelon model, FY 2022 activities will focus on developing and delivering the first release of the Echelon framework and testbed. This first release will enable project transition partners to begin building their respective Echelon compliant digital twins. In FY 2022, initial work will begin to validate the framework and testbed.</p> <p>FY 2023 Plans: FY 2023 tasks will complete the validation of the initial Echelon framework and testbed. Building on the first release of the Echelon framework, FY 2023 activities will focus on further development and validation of the framework's extensibility to support multi-function digital twins. Additional activities include mission engineering interfaces integration with the digital twin and testbed. FY 2023 will conclude with a multi-service demonstration of a digital twin within the Echelon testbed.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funds support the demonstration of a digital twin in the Echelon framework to validate the prototype's capability to provide a virtual integrated, multi-function, net-centric environment. The majority of hardware and software development, integration, and</p>		1.400	5.500
			7.900

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
testing occurs during FY 2023 with a surge during the final quarter to support final system development and validation. The developed capability will transition to the U.S. Air Force and U.S. Army upon project completion in FY 2023.				
<p>Title: Alternate Resilient Communications (ARC)</p> <p>Description: The ARC project is developing and demonstrating a prototype, communication capability to send and receive select command and control (C2) messages to users operating in challenging RF environments. In FY 2021, the project coordinated with adjacent systems and programs, the system was designed, and development of the initial prototype began. Additional details are classified.</p> <p>FY 2022 Plans: In FY 2022, activities will continue to develop a fully-integrated, functionally-relevant prototype system. Integration, assembly, and test of the ARC prototype will be conducted in laboratory and representative environments with operational components, subsystems and adjacent systems. Additional details are classified.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: In FY 2023, the prototype will transition to the U.S. Navy and the U.S. Air Force for platform integration and demonstration in operationally-relevant environments. Additional details are classified.</p>		1.250	1.250	-
<p>Title: Conceptual Prototyping to Support DoD Modernization Needs</p> <p>Description: This focus area supports in-year identification and execution of innovative prototyping for cutting-edge land, sea, undersea, air, and space capabilities critical to the National Defense Strategy and modernization needs and objectives of the Department of Defense (DoD). This effort matures key component technologies and representative prototypes of fully networked command, control, and communications; 5G; space; autonomy; hypersonics; microelectronics; cyber; quantum science; directed energy; bio-technology; and machine learning systems to accelerate development and adoption of cost effective and interoperable solutions for defense challenges. Selected limited duration projects design, mature, and deliver conceptual prototypes to reduce the time from idea to demonstrated capability; mitigate risk in DoD programs; and help characterize potential concepts of operations. Conceptual prototyping activities seek to rapidly develop and demonstrate capabilities that can help maintain the U.S. technological edge. These prototypes will be delivered to joint Service users to evaluate operational capabilities and inform requirements and technical feasibility of future acquisition programs. Development of advanced prototypes will involve partnerships with the Services, industry, academia, and non-traditional DoD partners.</p> <p>FY 2022 Plans: Projects will be selected in the year of execution to support National Defense Strategy priorities, DoD modernization needs, and gaps in the joint Services’ investments. Projects will focus on cost-effective, mission-focused efforts to design, mature, and deliver</p>		-	9.122	53.356

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B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
new concepts and technology prototypes aimed at supporting the Joint Force. Two to four prototype efforts are anticipated in FY 2022 leveraging Joint, Service, and interagency partnerships.					
FY 2023 Plans: Projects will be selected in the year of execution to support National Defense Strategy priorities, DoD modernization needs, and gaps in the joint Services' investments. Projects will focus on cost-effective, mission-focused efforts to design, mature, and deliver new concepts and technology prototypes aimed at supporting the Joint Force. Eight to fourteen prototype efforts are anticipated in FY 2023 leveraging Joint, Service, and interagency partnerships.					
FY 2022 to FY 2023 Increase/Decrease Statement: The change in funding reflected from FY 2022 to FY 2023 is the result of the FY 2022 Congressional reduction and the completion of four prototyping projects. FY 2022 was reduced by \$34.100 million via Congressional Directed Transfer to Program Element 0604331D8Z Rapid Prototyping Program (RPP) for execution of the Rapid Defense Experimentation Reserve (RDER).					
Title: Red Teaming to Support DoD Modernization Needs			-	8.188	7.989
Description: This focus area supports investigations, evaluations, and validations that assess the susceptibility and vulnerability of emerging technology fields, to quickly identify unanticipated disruptive opportunities and technological dead ends. Efforts include: (1) Early investigations and red teaming to identify and understand potential vulnerabilities and opportunities from emerging and conceptual technologies. Projects will help define and anticipate impacts from new technologies, including current DoD investments and external technologies, to understand operational utility and identify threats from tangentially related sectors that can have significant negative impacts on current DoD investments. (2) Maturation of Service and Defense Agency identified prototypes to enable red teaming validations and concept of operations (CONOPS) much earlier in the development cycle. These prototypes increase agility and rate of innovation for emerging capabilities, while reducing cost, schedule, and risk. (3) Exploring unconventional approaches to counter current DoD and adversary technologies through red teams; war games; simulation exercises; and studies that employ government laboratory scientists, subject matter experts, and students of science, technology, engineering, and math disciplines. Red teaming events range from distributed table-top games to simulated and live field exercises with non-traditional and operationally experienced participants. Deliverables include characterizations of future prototypes, requirement definitions, recommendations on system operational employment, potential strategic vulnerabilities, and likely countermeasures that could be taken by the threat, as well as potential counter-countermeasures to increase functionality or operational effectiveness of the system. The USD(R&E) will leverage these products to inform how technologies and integrated systems can perform in hostile environments; chart new investment paths; and, develop new CONOPS.					
FY 2022 Plans: Investment decisions for red teaming are made during the execution year in response to Department, Combatant Command, Service, and other government organization priorities and as new threats emerge or new opportunities are presented. In FY 2022,					

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023	
this project anticipates funding four to seven efforts to investigate red and blue impacts of technologies associated with DoD modernization needs. Project selection will be guided by DoD modernization needs, the National Defense Strategy, and priorities and gaps identified by the Department, Combatant Commands, Services, other government organizations, FFRDCs, academia, and industry as new threats emerge or new opportunities are presented. FY 2023 Plans: Investment decisions for red teaming are made during the execution year in response to Department, Combatant Command, Service, and other government organization priorities and as new threats emerge or new opportunities are presented. In FY 2023, this project anticipates funding four to six efforts to investigate red and blue impacts of technologies associated with DoD modernization needs. Project selection will be guided by DoD modernization needs, the National Defense Strategy, and priorities and gaps identified by the Department, Combatant Commands, Services, other government organizations, FFRDCs, academia, and industry as new threats emerge or new opportunities are presented. FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.					
Title: Silent Hammer (SH) Description: SH is a multi-year, multi-agency, series of field experimentation activities. SH explores and demonstrates new electronic warfare (EW) and cyber technologies and approaches through the use of large-scale, dynamic field experiments. SH includes scripted and dynamic scenarios to experiment with the efficacy of both existing and new capabilities to engage emerging electromagnetic spectrum threats. The EW Community of Interest, Executive Committees, and warfighters are involved in the selection of follow-on experimentation topics, technology demonstrations, and scoping of these efforts to ensure maximum relevance and value. The Joint Electronic Advanced Technology (JEAT) Program Element 0603618D8Z supports the experiment concept development and planning efforts for SH events, while DM&P supports SH experiment execution efforts. In FY 2021, SH completed experiment-planning and preparation for the second experiment which was executed in late-FY 2021. Work continues in FY 2022 using FY 2021 funds to complete data post-processing and analysis, and submit results and findings in the SH final report.		4.000	-	-	
Accomplishments/Planned Programs Subtotals		55.058	31.935	69.245	
		FY 2021	FY 2022		
Congressional Add: Emerging Capabilities Technology Support		7.500	-		
FY 2021 Accomplishments: This project supports the continued execution of an ongoing U.S. Air Force communications prototyping project. Previous resources provided above the President's budget in FY 2018,					

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		FY 2021	FY 2022
FY 2019, and FY 2020 prototyped and assessed the utility, operational user interest, and potential to transition these technologies to the warfighter. In FY 2021, the project further refined the prototype software and hardware. Work continues in FY 2022 and FY 2023 using FY 2021 funds to refine the prototype and complete testing with operational users. The capability developed will transition to the U.S. Special Operations Command (USSOCOM) for further development. This technology area is a congressional interest item and additional resources were provided above the President's budget.			
Congressional Add: Disruptive Air and Missile Defense FY 2021 Accomplishments: The Disruptive Air and Missile Defense project explores advanced sensor system concepts to enhance detection and tracking of threat systems. Previous resources provided above the President's budget in FY 2016, FY 2017, FY 2018, FY 2019, and FY 2020 developed an advanced sensor chip assembly (SCA) and prototype test units (PTU) incorporating the SCA to enable experimentation and validation of expected performance in operationally-relevant environments. In FY 2021, development of the PTUs continued with plans for several test and evaluation (T&E) events planned for FY 2022. Work continues in FY 2022 using FY 2021 funds to execute multiple T&E events, in both laboratory and operationally-relevant environments to validate system performance for operational concepts of interest to the Services and Combatant Commands. This technology area is a congressional interest item and additional resources were provided above the President's budget. Details of this project are classified.		5.000	-
Congressional Add: Open Source Intelligence (OSI) FY 2021 Accomplishments: Leveraging emerging open source intelligence tools and techniques, the OSI project provides the joint warfighter with the capability to rapidly winnow down open source data to actionable intelligence. Previous resources provided above the President's budget in FY 2018, FY 2019, and FY 2020 demonstrated a novel open source intelligence capability. In FY 2021, the project further developed strategies for collecting and exploiting open source information from various domains; and, algorithms/automated tools to prioritize threats and enhance data mining speeds. Work continues in FY 2022, FY 2023, and FY 2024 using FY 2021 funds to demonstrate how machine learning data analytic techniques and open source data can be leveraged to address enduring Great Power Competition (GPC) challenges. The capability developed will transition to the U.S. Army and USSOCOM for further development. This technology area is a congressional interest item and additional resources were provided above the President's budget. FY 2022 Plans: Leveraging the additional funds provided in FY 2022, the OSI project will identify and integrate additional open sources domains to provide a more robust intelligence tool. The scope of work resourced with		3.000	3.000

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		FY 2021	FY 2022
FY 2021 and FY 2022 funds is anticipated to complete in FY 2024. This technology area is a congressional interest item and additional resources were provided above the President's budget.			
Congressional Add: Remote Advise and Assist (RAA) Technology Development FY 2021 Accomplishments: RAA directly supports critical decision and coordination processes enabling increased survivability for the joint warfighter and partners. Previous resources provided above the President's budget in FY 2019 and FY 2020 developed and validated system performance for RAA prototypes to provide threat detection and classification of airborne and ground-based threats in operationally-relevant environments. In FY 2021, the project initiated design changes to enable higher forms of machine autonomy to increase the depth of analysis and the speed at which decisions can be executed. Work continues in FY 2022, FY 2023, and FY 2024 using FY 2021 funds to implement and test the design changes. The additional capabilities will be demonstrated in a final demonstration tentatively planned for October 2022. The prototypes developed will transition to the U.S. Army and USSOCOM for further development. This technology area is a congressional interest item and additional resources were provided above the President's budget.		8.000	-
Congressional Add: Artificial Intelligence Enabled Sensor Network (AIESN) FY 2021 Accomplishments: AIESN streamlines warfighter decision-making, reducing cognitive burden to provide unparalleled information advantage at the tactical edge. Previous resources provided above the President's budget in FY 2019 and FY 2020 initiated development of a laboratory prototype to characterize potential processing and data distribution enhancements achievable at the tactical edge. In FY 2021, collection of data in operationally-relevant environments was initiated; and, early proof-of-concept demonstrations were conducted with the warfighter to refine the AIESN concept and system architecture. Development of AIESN continues in FY 2022, FY 2023, and FY 2024 using FY 2021 funds to: finalize the AIESN system concept and architecture; develop the prototype; and, demonstrate the capability in an operationally-relevant environment. These activities will be executed in coordination with the United States European Command (USEUCOM) to align the prototype capabilities with future Great Power Competition (GPC) problem sets. Specific demonstrations and activities will be finalized within the period of performance of execution. The prototype will transition to the U.S. Army and USSOCOM for further development. This technology area is a congressional interest item and additional resources were provided above the President's budget.		8.400	-
Congressional Add: Hypersonic Modeling and Simulation Center of Excellence FY 2022 Plans: In FY 2022, the project will establish a Hypersonics Research Center of Excellence focused on experimental and computational analysis of hypersonic flows, thermal protection systems, and other hypersonic phenomenology to support advanced hypersonic technology prototyping. Specific demonstrations and activities		-	4.600

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	FY 2021	FY 2022
will be finalized within the project execution period of performance. This technology area is a congressional interest item and additional resources were provided above the President's budget.		
Congressional Add: Ship-Based Multi-Sensor Prototype Development and Demonstration FY 2022 Plans: In FY 2022, the project will identify novel sensor technologies for integration into a multimodal sensor prototype. Combining multiple sensor technologies will enable the prototype to provide a more accurate and robust capability to detect, identify, classify, and track targets in a maritime environment. An at-sea demonstration of the prototype is anticipated to evaluate its performance in operationally-relevant environments. Demonstrations and activities will be finalized within the project execution period of performance. This technology area is a congressional interest item and additional resources were provided above the President's budget.	-	8.000
Congressional Adds Subtotals	31.900	15.600

C. Other Program Funding Summary (\$ in Millions)
 N/A

Remarks

D. Acquisition Strategy
 ECTD leverages the DoD's most efficient and effective acquisition approaches for rapid prototyping. This includes using Other Transaction Authorities, Broad Area Announcements, and new or existing contract vehicles.

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Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603338D8Z / Defense Modernization and Prototyping				Project (Number/Name) 722 / Time Sensitive Targeting Defeat (TSTD)			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
722: Time Sensitive Targeting Defeat (TSTD)	0.000	17.768	-	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2022, funding and appropriate project investment areas from Project Code 722 Time Sensitive Targeting Defeat (TSTD) transferred to Program Element 0603648D8Z Joint Capability Technology Demonstration (JCTD) for proper alignment and execution. As part of the President's Budget 2023, all out year funding associated with the TSTD project code transfers to Program Element 0603648D8Z, JCTD program.

A. Mission Description and Budget Item Justification

TSTD funds prototyping and experimentation activities that accelerate the development and fielding of capabilities to address the find, fix, and finish kill-web against high-value targets. TSTD prototyping and experimentation activities employ the military utility of prototypes and experiments by leveraging technical demonstration programs to evaluate innovative capabilities in operationally-relevant environments with direct warfighter involvement and feedback. TSTD leverages major exercise series, such as Northern Edge and Valiant Shield, as it executes the Joint Combined Demonstration Campaign (JCDC) and Tactical Responsive Intelligence, Surveillance, and Reconnaissance (ISR) Platforms and Payloads Watching Isolated Remote Environments (TRIPPWIRE) prototype and experiment venues. JCDC is a multi-year campaign that integrates prototypes and experiments into operational demonstrations and exercises to facilitate transition of prototype capabilities aligned with the DoD modernization priorities. TRIPPWIRE is a DoD initiative to operationalize the stratosphere by offering increased demonstrations of high-altitude ISR and communication systems.

Selected projects and experiments extend Service and Defense Agency investments by leveraging prototypes developed by traditional and non-traditional industry partners, utilizing proven commercial- and government-off-the-shelf technologies, rapidly maturing technologies within Service laboratories and Federally Funded Research and Development Centers (FFRDCs), and, leveraging technologies from allied nations to rapidly identify and address gaps within current and developing kill chain capabilities identified by the Services, Combatant Commands (CCMDs), and Joint Staff. Projects inform Service programs of record in addition to providing Services and CCMDs with residual leave behind capabilities for rapid fielding.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Time-Sensitive Target Defeat Focus Area	7.768	-	-
Description: This project addresses the need for distributed, rapidly-deployed capabilities that can provide persistent sensing to find, fix, and finish time-sensitive threats by integrating prototypes and experiments into a series of multi-domain operational demonstrations. Demonstrations focus on evaluating how the Joint Force can leverage modernization technologies, commercial space-based capability, and operationalization of the stratosphere to refine hypersonic and long-range fires kill chains to counter time-sensitive targets. In FY 2021, multiple prototype demonstrations were completed in the U.S. Indo-Pacific Command			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
(USINDOPACOM) and U.S. European Command (USEUCOM) regions. Integrating communication, ISR sensors and platforms from both commercial and DoD entities, these experiments developed new concepts of employment and informed Service acquisition programs.			
Accomplishments/Planned Programs Subtotals		7.768	-
	FY 2021	FY 2022	
Congressional Add: Stratospheric Balloon Research	10.000	-	
FY 2021 Accomplishments: The Stratospheric Balloon Research project directly supports the National Defense Strategy's priority for delivering innovative stratospheric prototyping capabilities and operationally demonstrating Joint Warfighting Concepts to increase our military advantage across the force. In coordination with Services, Combatant Commands, and Allied partners, an experimentation campaign was completed in FY 2021 to validate that high-altitude balloon (HAB) platforms can meet operational needs and define performance requirements for out-year Service programs. Integrating HAB platforms into operational exercises enabled direct warfighter involvement to mature future HAB Concept of Operation and refine requirements for Service programs. Additional details of this project are classified.			
Congressional Adds Subtotals	10.000	-	
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
Time Sensitive Target Defeat (TSTD) leverages the DoD's most efficient and effective acquisition approaches for rapid prototyping to align with the Department modernization priorities. Prototyping partners include small businesses and non-traditional performers, industry, Federally Funded Research and Development Centers, and University Affiliated Research Centers.			

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Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603338D8Z / <i>Defense Modernization and Prototyping</i>				Project (Number/Name) 723 / <i>Red Teaming (RT)</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
723: <i>Red Teaming (RT)</i>	0.000	5.322	-	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2022, the Red Teaming project code transitioned to a focus area under Project Code 721 Emerging Capabilities Technology Development (ECTD).

A. Mission Description and Budget Item Justification

The Red Teaming project supports assessments and validations to stress and assess emerging systems with the intent of gaining or maintaining overmatch earlier in the life cycle. The project helps to assess the susceptibility and vulnerability of emerging technologies and newly developed systems and to identify unanticipated disruptive opportunities and technological dead ends. The project improves systems by reducing vulnerabilities and providing a holistic understanding of employment risks in operationally representative environments and against potential threats prior to full funding commitments. The Red Teaming project supports three broad types of red teaming: (1) Early stage technology discovery and assessments of weaknesses and opportunities of pre-development technologies from an adversary perspective; (2) Targeted, low-fidelity prototypes to assess utility and inform design choices prior to funding commitments; and (3) Red teams, war games, and field tests with maturing technology to understand how to implement new technologies and adapt to adversary responses. This effort leverages the innovative capabilities of other defense red teaming organizations within the Department, Federally Funded Research and Development Centers (FFRDCs), government laboratories, and academia. Deliverables will inform requirements, develop new concepts of operations (CONOPS), and help accelerate technology acquisition pathways for joint missions.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Red Teaming to Support DoD Modernization Priorities	3.877	-	-
Description: The project funds efforts to explore new joint mission capabilities in a competitive environment. Efforts include: (1) Early investigations and red teaming to identify and understand potential vulnerabilities and opportunities from emerging and conceptual technologies. Projects will help define and anticipate impacts from new technologies, including current DoD investments and external technologies, to understand operational utility and identify threats from tangentially related sectors that can have significant negative impacts on current DoD investments. (2) Maturation of Service and Defense Agency identified prototypes to enable red teaming validations and CONOPS earlier in the development cycle. These prototypes increase agility and rate of innovation for emerging capabilities, while reducing cost and risk. (3) Exploring unconventional approaches to counter current DoD and adversary technologies through red teams, war games, simulation exercises, and studies that employ government laboratory scientists, subject matter experts, and students of science, technology, engineering, and math disciplines. Red teaming events range from distributed table-top games to simulated and live field exercises with non-traditional and operationally experienced participants. Deliverables include characterizations of future prototypes, requirement definitions, recommendations on system operational employment, potential vulnerabilities, and likely countermeasures that could be taken by the threat, as well as potential counter-countermeasures to increase functionality or operational effectiveness of the system. The			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>USD(R&E) will leverage these products to inform how technologies and integrated systems can perform in hostile environments and develop new CONOPS.</p> <p>In FY 2021, red teaming efforts were conducted to support the National Defense Strategy's priority for increased lethality and the Department of Defense's modernization priorities for cyber, autonomy, energy, and contested logistics. Prototypes were assessed for vulnerabilities at red teaming events with operationally-experienced participants. A test was conducted to further assess radar vulnerabilities using a low-altitude, low-speed aircraft. Maturing technologies, in support of artificial intelligence and contested logistics, were red teamed to, either understand how best to implement and adapt the technology into CONOPS, or determine how best to counter adversary responses to the technology.</p>			
<p>Title: Tactical Network Outsider Threat</p> <p>Description: The Tactical Network Outsider Threat project is developing a prototype device to enable red teaming organizations to portray outsider threats on tactical networks that do not use IP-based communications. The prototype can be placed on systems under test to better portray outside threats during adversarial cybersecurity development tests and adversarial assessments, thereby ensuring U.S. systems are more robust and secure when faced with near-peer cyber adversaries. In FY 2021, the project developed the initial system requirements and began design, implementation, and testing of the software and hardware components. Work continues in FY 2022 using FY 2021 funds to finalize system design, fabrication, and complete final testing before the prototype transitions to the U.S. Army for additional testing.</p>		1.445	-
Accomplishments/Planned Programs Subtotals		5.322	-
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603342D8Z I <i>Defense Innovation Unit (DIU)</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	29.268	34.401	26.749	42.925	-	42.925	58.838	62.422	30.028	30.628	-	-
434: <i>DIU</i>	29.268	34.401	26.749	42.925	-	42.925	58.838	62.422	30.028	30.628	-	-

Note

New Start (Y/N): Partial - \$15M Defense Advanced Battery Supply Chain Program

A. Mission Description and Budget Item Justification

The Defense Innovation Unit (DIU) mission is to strengthen U.S. national security by accelerating the adoption of commercial technology throughout the military and growing the national security innovation base. DIU partners with organizations across the DoD and the interagency to rapidly prototype, field, and scale commercial solutions that can save lives, lead to new operational concepts, increase efficiencies, and save taxpayer dollars. With offices in Silicon Valley, Boston, Austin, Chicago, and in the Pentagon, DIU is able to attract the best and brightest talent and cutting-edge solutions.

The National Defense Strategy for FY 2022 asserts that we have returned to an era of inter-state strategic competition with Russia and China, heightening the sense of urgency with which the nation, and Department of Defense (DoD), must reform our acquisition policies and approach to sustaining military-technical superiority. Notably, 11 of the 14 critical technology focus areas are dual use and rapidly developed by the commercial sector. While adversaries are challenging the U.S. across several dimensions, most importantly, our near peer competitors are at par or ahead of the U.S. in critical technology areas. Consistent with the FY 2023 Office of Management and Budget (OMB)/Office of Science and Technology Policy (OSTP) research and development budget priorities, this new era of competition requires technological superiority to ensure the United States' ability to project power, maintain international norms and rule of law, provide credible deterrence, and prevail in conflict.

DIU increases the Department's access to commercial technologies and talent, with the ultimate goal of fielding leading-edge technology to warfighters at the speed of relevance. Working across the country, and in collaboration with our allies and partners, DIU is developing new ways of doing business, growing our national security innovation base to include more "non-traditional" companies that had previously not collaborated with the military, working with traditional vendors in novel ways to increase efficiency, and challenging innovators to share their knowledge and expertise in support of our nation's defense.

Through a competitive prototype process, DIU identifies and provides access to technology companies and products on behalf of DoD organizations. Additionally, DIU executes projects to leverage commercial sector technology analogous to military applications thereby increasing dual-use technology agility for the DoD. DIU Prototyping funds facilitate the award of projects that can augment commercial technologies, existing government-owned capabilities, or concepts for defense application.

DIU focuses on six technology areas where commercial industry is the lead:

- Artificial Intelligence (AI)/ Machine Learning (ML) – Applying AI/ML learning to accelerate critical decision making and operational impact.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022		
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)		R-1 Program Element (Number/Name) PE 0603342D8Z I Defense Innovation Unit (DIU)				
<ul style="list-style-type: none">• Autonomy – Adopting and countering autonomous systems with a focus on human-machine interaction and scalable teaming.• Cyber – Making enterprise combat information open, accessible, and secure for defense personnel across the globe.• Energy - Leveraging proven advancement in energy and materials technology to enhance capabilities and strengthen resilience across installation and distributed operations.• Human Systems – Optimizing the human system and its enabling platforms through enhanced equipment, innovative training, and novel health applications.• Space – Developing on-demand access to space, persistent satellite capabilities, and broadband space data transfer.						
B. Program Change Summary (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget		34.401	31.873	0.000	-	0.000
Current President's Budget		34.401	26.749	42.925	-	42.925
Total Adjustments		0.000	-5.124	42.925	-	42.925
• Congressional General Reductions		-	-5.024			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-	-			
• Congressional Adds		-	-			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-	-			
• FFRDC		-	-0.100	-	-	-
• Adjustments to Budget Year		-	-	26.962	-	26.962
• Economic Assumption		-	-	0.963	-	0.963
• Defense Advanced Battery Supply Chain		-	-	15.000	-	15.000
Congressional Add Details (\$ in Millions, and Includes General Reductions)						
Project: 434: DIU				FY 2021		FY 2022
Congressional Add: Multi Orbital Platform				4.500		-
Congressional Add: Small Tactical Imagery Satellites				5.000		-
Congressional Add Subtotals for Project: 434				9.500		-
Congressional Add Totals for all Projects				9.500		-
Change Summary Explanation						
In FY 2022, program reduced by -\$5.024 million for unjustified increase.						
FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.						

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603342D8Z / Defense Innovation Unit (DIU)				Project (Number/Name) 434 / DIU			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
434: DIU	29.268	34.401	26.749	42.925	-	42.925	58.838	62.422	30.028	30.628	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Defense Innovation Unit (DIU) mission is to strengthen U.S. national security by accelerating the adoption of commercial technology throughout the military and growing the national security innovation base. DIU partners with organizations across the DoD and the interagency to rapidly prototype, field, and scale commercial solutions that can save lives, lead to new operational concepts, increase efficiencies, and save taxpayer dollars. With offices in Silicon Valley, Boston, Austin, Chicago, and in the Pentagon, DIU is able to attract the best and brightest talent and cutting-edge solutions.

The National Defense Strategy for FY 2022 asserts that we have returned to an era of inter-state strategic competition with Russia and China, heightening the sense of urgency with which the nation, and Department of Defense (DoD), must reform our acquisition policies and approach to sustaining military-technical superiority. Notably, 11 of the 14 critical technology focus areas are dual use and rapidly developed by the commercial sector. While adversaries are challenging the U.S. across several dimensions, most importantly, our near peer competitors are at par or ahead of the U.S. in critical technology areas.

Consistent with the FY 2023 Office of Management and Budget (OMB)/Office of Science and Technology Policy (OSTP) research and development budget priorities, this new era of competition requires technological superiority to ensure the United States' ability to project power, maintain international norms and rule of law, provide credible deterrence, and prevail in conflict.

DIU increases the Department's access to commercial technologies and talent, with the ultimate goal of fielding leading-edge technology to warfighters at the speed of relevance. Working across the country, and in collaboration with our allies and partners, DIU is developing new ways of doing business, growing our national security innovation base to include more "non-traditional" companies that had previously not collaborated with the military, working with traditional vendors in novel ways to increase efficiency, and challenging innovators to share their knowledge and expertise in support of our nation's defense.

Through a competitive prototype process, DIU identifies and provides access to technology companies and products on behalf of DoD organizations. Additionally, DIU executes projects to leverage commercial sector technology analogous to military applications thereby increasing dual-use technology agility for the DoD. DIU Prototyping funds facilitate the award of projects that can augment commercial technologies, existing government-owned capabilities, or concepts for defense application.

DIU focuses on six technology areas where commercial industry is the lead:

- Artificial Intelligence (AI)/ Machine Learning (ML) – Applying AI/ML learning to accelerate critical decision making and operational impact.
- Autonomy – Adopting and countering autonomous systems with a focus on human-machine interaction and scalable teaming.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603342D8Z I Defense Innovation Unit (DIU)	Project (Number/Name) 434 I DIU		
<ul style="list-style-type: none">• Cyber – Making enterprise combat information open, accessible, and secure for defense personnel across the globe.• Energy - Leveraging proven advancement in energy and materials technology to enhance capabilities and strengthen resilience across installation and distributed operations.• Human Systems – Optimizing the human system and its enabling platforms through enhanced equipment, innovative training, and novel health applications.• Space – Developing on-demand access to space, persistent satellite capabilities, and broadband space data transfer.					
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Title: Defense Innovation Unit (DIU) Description: The U.S. DoD relies on innovation to maintain our nation's ability to deter, and if need be, prevail in conflict. With outposts in Mountain View, California; Cambridge, Massachusetts; Washington, D.C.; Austin, Texas; and Chicago, Illinois, DIU serves as a bridge between those in the U.S. Military executing national security and defense missions with companies developing cutting-edge commercial technology. DIU continuously experiments with methods to identify, contract, prototype, and transition novel commercial solutions from leading companies to the warfighter for applications in headquarters or operational environments and transfer technology with commercial entities that would not otherwise do work with the DoD. The end goal is to accelerate DoD adoption of cutting-edge technology and grow the national security innovation base to support U.S. military-technical superiority. FY 2022 Plans: DIU will continue its mission to identify and deliver cutting-edge commercial innovation to the Joint Force. DIU is rapidly prototyping and deploying innovative commercial technologies to fill critical capability gaps identified by DoD customers in the Services, components, Defense Agencies, and Combatant Commands. DIU works to solve challenges and issues for the Department in areas such as artificial intelligence and machine learning, autonomy, cyber, energy, human systems, cyber, and space. FY 2023 Plans: DIU will continue its mission to identify and deliver cutting-edge commercial innovation to the Joint Force. DIU is rapidly prototyping and deploying innovative commercial technologies to fill critical capability gaps identified by DoD customers in the Services, components, Defense Agencies, and Combatant Commands. DIU works to solve challenges and issues for the Department in areas such as artificial intelligence and machine learning, autonomy, human systems, cyber, space, and advanced energy and materials. FY 2022 to FY 2023 Increase/Decrease Statement: The decrease from FY 2022 to FY 2023 is due to a one-time increase in FY 2022 to support a requirement for the Artificial Intelligence (AI) portfolio.			24.901	26.749	27.925
Title: Defense Advanced Battery Supply Chain			-	-	15.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603342D8Z / <i>Defense Innovation Unit (DIU)</i>	Project (Number/Name) 434 / <i>DIU</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>Description: DIU will rapidly prototype and deploy Battery Energy Storage Systems (BESS) to support long duration energy storage needs for the supports the long duration storage focus on resiliency for 4 to 8 hours. The Defense Innovation Unit (DIU) will prototype commercial BESS solutions that are demonstrating up to 100 hours of battery storage for resiliency on multiple DoD installations that directly support military operations such as data centers, hospitals, or mission support equipment.</p> <p>FY 2023 Plans: Align the Department's battery requirements to commercial battery standards currently being used by the electric vehicle (EV) market by:</p> <ul style="list-style-type: none"> - Testing EV batteries to DoD standards. - Prototyping EV batteries to meet DoD standards. - Investing in domestic EV battery production to ensure security of supply for DoD needs. <p>Matching the alignment of DoD battery requirements to commercial battery standards currently being used by the EV market allows the Department access to more advanced batteries at reduced costs.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: New effort beginning in FY 2023.</p>			
Accomplishments/Planned Programs Subtotals		24.901	26.749
		FY 2021	FY 2022
Congressional Add: Multi Orbital Platform		4.500	-
FY 2021 Accomplishments: These funds support ongoing work to create multi-orbit platforms in order to enable the establishment of an in-space logistics network. In particular, the funds will accelerate current DIU efforts related to orbital transfer and hosting platforms, in-space refueling, and supporting interfaces. These efforts take place primarily during preliminary and critical design review, which include some initial assembly integration and testing activities.			
Congressional Add: Small Tactical Imagery Satellites		5.000	-
FY 2021 Accomplishments: These funds support multiple tactical imagery efforts, to include the U.S. Army Tactical GEOINT ("TacGEO") project requirements for satellite shipment and storage review and on-orbit checkout; the joint-sponsored "Peacetime Indications & Warnings" project requirement for preliminary and critical design reviews; assembly integration & test, flight readiness review, system checkout; and a new U.S. Army			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense							Date: April 2022				
Appropriation/Budget Activity 0400 / 3			R-1 Program Element (Number/Name) PE 0603342D8Z / Defense Innovation Unit (DIU)			Project (Number/Name) 434 / DIU					
unmanned stratospheric systems project requirements for replicating space-based imagery capabilities from high altitude.							FY 2021	FY 2022			
							Congressional Adds Subtotals		9.500	-	
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• BA 04; O&M: PE 0901583D8Z	12.397	16.659	17.561	-	17.561	17.960	18.322	18.687	19.063	-	-
Remarks											
NA											
D. Acquisition Strategy											
N/A											

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)	PE 0603375D8Z / Technology Innovation											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	139.585	25.884	39.761	109.535	0.000	109.535	42.618	43.885	44.806	45.702	Continuing	Continuing
375: Technology Innovation	139.585	25.884	25.323	109.535	0.000	109.535	42.618	43.885	44.806	45.702	Continuing	Continuing
376: Quantum Information Science Technology Innovation	0.000	0.000	14.438	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	-

Note

New Start (Y/N): Partial, \$74.505M National Security Council Efforts program

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Strategic Attacks, Defend the Homeland, and Build a Resilient Joint Force and Defense Ecosystem.

The Department of Defense (DoD) has a long history of technological breakthroughs and innovations originating from within the Department. In order to sustain technological superiority, the Department must take advantage of the rapid evolution of emerging technologies that will be a source of battlefield advantage, when integrated with military systems and novel concepts of operation.

Leveraging innovative technologies from both defense and commercial sources, to include non-traditional sources such as startup companies, has the potential to rapidly address warfighter problem sets in areas where commercial innovation outstrips government investment in the same technology areas. This funding is currently focused on demonstrating quantum and biotechnology efforts within the Department's Modernization Technology Areas that contribute to the broader joint mission needs.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	27.693	54.433	0.000	0.000	0.000
Current President's Budget	25.884	39.761	109.535	0.000	109.535
Total Adjustments	-1.809	-14.672	109.535	0.000	109.535
• Congressional General Reductions	-	-14.500			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.844	-			
• SBIR/STTR Transfer	-0.960	-			
• Other Reprogramming	-0.005	-	-	-	-
• FFRDC	-	-0.172	-	-	-

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense					Date: April 2022	
Appropriation/Budget Activity			R-1 Program Element (Number/Name)			
0400: Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)			PE 0603375D8Z I Technology Innovation			
• Adjustments to Budget Year			-	-	33.822	- 33.822
• Economic Assumption			-	-	1.208	- 1.208
• Higher Classification			-	-	74.505	- 74.505
<u>Change Summary Explanation</u>						
In FY 2022, program reduced by \$14.500 million for unjustified growth.						
FY 2023 funding increase reflects the fact that the FY 2022 President’s Budget request did not include out-year funding.						
FY 2023 funding increase of \$74.505 million is intended for R&D efforts to support the DoD aspects of the National Security Council-led efforts to understand the biological and physical mechanisms that may relate to emerging Anomalous Health Incidents affecting DoD and other U.S. Government personnel.						

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603375D8Z / <i>Technology Innovation</i>				Project (Number/Name) 375 / <i>Technology Innovation</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
375: <i>Technology Innovation</i>	139.585	25.884	25.323	109.535	0.000	109.535	42.618	43.885	44.806	45.702	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program focuses on rapid innovation and demonstration efforts to address priority warfighter problem sets and National Defense Strategy focus areas. The current effort is focused on development of atomic clocks and biotechnology to accelerate progress along these two DoD Modernization priority roadmaps. Combatant Commanders and the Intelligence Community (IC) continue to receive signals that adversaries are looking to deny access to Global Positioning System (GPS) time as a way to disrupt the common networked tactical picture. Under this program, commercial companies will mature DARPA's investment in innovative atomic clocks with tri-service technical oversight, creating a prototype Next Generation Atomic Clock (NGAC) for commercial production. This program will also demonstrate emerging biotechnology advancements to stimulate additional investment in biotechnology that can address DoD needs.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Technology Innovation	25.884	25.323	35.030
<p>Description: The program focuses rapid innovation and demonstration in emerging defense and commercial technology areas to address the National Defense Strategy technology focus areas and priority warfighter problem sets. Prior year projects included funding of promising commercial advanced technology demonstration projects in the areas of biotechnology, quantum science, fully networked command, control, and communications, and space.</p> <p>FY 2022 Plans: Maintain support for the following Quantum and Biotechnology efforts: (1) Transition path for DARPA's atomic clock with enhanced stability to reach technology readiness level (TRL) 7 by FY 2025 and commercial availability by FY 2027; FY 2022 efforts will be focused on clock component development and initial build, with technology development to mitigate risks through integration, analysis, and testing. (2) Advanced emerging biotechnologies demonstrated against operational use cases; projects will be competitively selected from proposals across DoD, with a focus on multi-lab and multi-Service efforts that will build partnerships across the DoD biotechnology community.</p> <p>FY 2023 Plans: (1) Component maturation and clock demonstrations will result in a technology readiness assessment for a final Next Generation Atomic Clock (NGAC) design by the end of FY 2023. Future reductions in size, weight, and power target a technology readiness level (TRL) 7 by FY 2025 and commercial availability for DoD use by FY 2027. (2) Demonstration of biotechnology methods that address warfighter needs.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603375D8Z / <i>Technology Innovation</i>	Project (Number/Name) 375 / <i>Technology Innovation</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
FY 2023 increase in support of biotechnology methods that address warfighter needs.			
Title: National Security Council-led Efforts FY 2023 Plans: Initiate R&D efforts to support the DoD aspects of the National Security Council-led efforts to understand the biological and physical mechanisms that may relate to emerging Anomalous Health Incidents affecting DoD and other U.S. Government personnel FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 funding increase is intended for R&D efforts to support the DoD aspects of the National Security Council-led efforts to understand the biological and physical mechanisms that may relate to emerging Anomalous Health Incidents affecting DoD and other U.S. Government personnel.		-	-
			74.505
Accomplishments/Planned Programs Subtotals		25.884	25.323
C. Other Program Funding Summary (\$ in Millions) N/A Remarks N/A D. Acquisition Strategy N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603375D8Z / <i>Technology Innovation</i>				Project (Number/Name) 376 / <i>Quantum Information Science Technology Innovation</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
376: <i>Quantum Information Science Technology Innovation</i>	0.000	0.000	14.438	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification <p>The Department of Defense (DoD) has pioneered and advanced quantum information science (QIS) for nearly thirty years. In order to sustain technological superiority, the Department must continue to proactively engage in QIS research and development in timing, sensing, computing, and networking applications.</p> <p>Leveraging innovative technologies from both defense and commercial sources, to include non-traditional sources such as startup companies, has the potential to rapidly advance this field to address warfighter problem sets. This funding will be used to demonstrate and mature emerging QIS technologies.</p>												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: Quantum Information Science Technology Innovation FY 2022 Plans: Maintain and expand support across OUSD(R&E) Quantum Science Roadmap technology areas: (1) Quantum Inertial Measurement Unit Experiment: Pursuing prototyping phase. (2) Optical Clock Prototyping: Acceleration of prototyping. FY 2022 to FY 2023 Increase/Decrease Statement: FY 2022 OMB Passback Settlement funding for Quantum Information Science Technology Innovation.									-	14.438	-	
Accomplishments/Planned Programs Subtotals									-	14.438	-	
C. Other Program Funding Summary (\$ in Millions) N/A Remarks D. Acquisition Strategy N/A												

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense												Date: April 2022					
Appropriation/Budget Activity 0400 / 3								R-1 Program Element (Number/Name) PE 0603375D8Z / <i>Technology Innovation</i>						Project (Number/Name) 376 / <i>Quantum Information Science Technology Innovation</i>			

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Technology Innovation Efforts																												
Biotech Optimized for Operational Solutions and Tactics (BOOST) program																												
Atomic Clocks																												
Quantum Sensing																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603375D8Z / <i>Technology Innovation</i>	Project (Number/Name) 376 / <i>Quantum Information Science Technology Innovation</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Technology Innovation Efforts</i>				
Biotech Optimized for Operational Solutions and Tactics (BOOST) program	3	2021	4	2025
Atomic Clocks	1	2021	4	2025
Quantum Sensing	1	2021	4	2025

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)	PE 0603527D8Z / Retract Larch											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	800.110	90.918	98.862	79.493	0.000	79.493	76.816	78.941	81.335	82.961	Continuing	Continuing
527: Retract Larch	800.110	90.918	98.862	79.493	0.000	79.493	76.816	78.941	81.335	82.961	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

Classified.

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress. For further information, please contact the Principal Deputy, Director of Defense for Research and Technology, in the Office of the Under Secretary of Defense for Research and Engineering.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	130.220	99.175	0.000	0.000	0.000
Current President's Budget	90.918	98.862	79.493	0.000	79.493
Total Adjustments	-39.302	-0.313	79.493	0.000	79.493
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-35.000	-			
• SBIR/STTR Transfer	-4.277	-			
• Other reprogramming	-0.025	-	-	-	-
• FFRDC	-	-0.313	-	-	-
• Adjustments to Budget Year	-	-	76.751	-	76.751
• Economic Assumption	-	-	2.742	-	2.742

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603527D8Z / <i>Retract Larch</i>				Project (Number/Name) 527 / <i>Retract Larch</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
527: <i>Retract Larch</i>	800.110	90.918	98.862	79.493	0.000	79.493	76.816	78.941	81.335	82.961	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification
 This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress. For further information, please contact the Director, Resource Management in the Office of the Under Secretary of Defense for Research and Engineering

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Title: Retarct Larch	90.918	98.862	79.493
Description: Information is classified.			
FY 2022 Plans: Information is classified.			
FY 2023 Plans: Information is classified.			
FY 2022 to FY 2023 Increase/Decrease Statement: Information is classified.			
Accomplishments/Planned Programs Subtotals	90.918	98.862	79.493

C. Other Program Funding Summary (\$ in Millions)
 N/A

Remarks

D. Acquisition Strategy
 N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>					R-1 Program Element (Number/Name) PE 0603618D8Z <i>I Joint Electronic Advanced Technology</i>							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	14.773	18.164	19.218	0.000	19.218	20.141	20.718	21.170	21.593	Continuing	Continuing
245: <i>EW Enterprise Exploration and Innovation</i>	-	14.773	18.164	19.218	0.000	19.218	20.141	20.718	21.170	21.593	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression and Prevail in Conflict, Build Sustainable and Long-Term Advantage, and Building a Resilient Joint Force and Defense Ecosystem.

The electromagnetic spectrum (EMS) environment (EME) is the largest and most complex warfighting environment. It is universally pervasive, largely unseen, and can only be perceived through the use of advanced electronic technologies. Understanding and addressing EME warfighting challenges is essential to all military operations. It is through the use of EMS technologies that we perceive operational realities, the state and disposition of all military and nonmilitary forces and groups within operational environments, and coordinate all actions of our military forces.

Historically, the United States has had significant technological advantages in EMS warfighting technologies, specifically sensors, communications, and countermeasures. This superiority is being challenged due to the rapid commercialization of advanced electronic systems and components, the broad proliferation of these technologies, and the concurrent rise of cyber-related EMS technologies. Potential adversaries have leveraged these advances to develop and field competing and asymmetric capabilities to offset historic U.S. advantages. These efforts have made U.S. operations in the EMS and cyberspace significantly more difficult, and they continue to do so at an accelerating rate. Adversary radars are evolving from fixed analog systems to programmable digital variants with agile waveforms and unknown behaviors making preprogrammed electronic countermeasure less effective. Foreign developments include new generations of challenging threats ranging from small unmanned air systems and easily transportable Man-Portable Air Defense Systems (MANPADS) to dedicated anti-access area denial (A2/AD) military systems including integrated air defense systems and increasingly capable cruise and ballistic missiles that have incorporated the most advanced sensors, communication and electromagnetic warfare (EW) technologies.

Because the accelerating pace of technological innovation has increased the rate at which new EMS and cyber threats are appearing, the effective operational lifetime of many advanced technologies has decreased. For all of these reasons, the Department of Defense (DoD) must develop and field new EW and EW-Cyber capabilities faster, at much lower costs, to be broadly integrated and employed across the entire force structure.

The Joint Electronic Advanced Technology (JEAT) program was established to address these challenges through efforts designed to substantially accelerate the development and maturing of innovative technologies in order to: (1) address new EW and EW-Cyber warfighting challenges; and (2) provide new, leap-ahead EMS

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603618D8Z I <i>Joint Electronic Advanced Technology</i>
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warfighting capabilities to ensure U.S. warfighters will always have decisive EW and EW-Cyber overmatch capabilities. The JEAT program specifically focuses on EW and EW-Cyber-related technologies that fall outside the Services' purviews or are developed synergistically with a transition to the Services post maturation.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	15.152	18.221	0.000	0.000	0.000
Current President's Budget	14.773	18.164	19.218	0.000	19.218
Total Adjustments	-0.379	-0.057	19.218	0.000	19.218
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.376	-			
• SBIR/STTR Transfer	-	-			
• Other Reprogramming	-0.003	-	-	-	-
• FFRDC	-	-0.057	-	-	-
• Adjustments to Budget Year	-	-	18.555	-	18.555
• Economic Assumption	-	-	0.663	-	0.663

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603618D8Z / Joint Electronic Advance d Technology				Project (Number/Name) 245 / EW Enterprise Exploration and Innovation			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
245: EW Enterprise Exploration and Innovation	-	14.773	18.164	19.218	0.000	19.218	20.141	20.718	21.170	21.593	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Electromagnetic Warfare Enterprise Exploration and Innovation (EW E&I) research efforts identify, explore, and accelerate the maturing and demonstration of new EW-related and EW-Cyber-related technologies. Technologies enabling and facilitating electromagnetic attack (EA), electromagnetic protection (EP), and electromagnetic support (ES) are covered, including technologies enabling “over-the-air” algorithmic warfare utilizing existing and new generations of EW, radiofrequency (RF) and optical systems. To address increasingly sophisticated evolving threats, EW E&I efforts also seek to accelerate the development of non-traditional EMS sensing and ultra wideband approaches (greater than a decade of frequency) to enable continuous radiofrequency (RF) surveillance and distributed phase synchronous RF sensing. EW E&I research products are explored and developed in state-of-the-art laboratories and validated side-by-side with numerous competing technologies and systems from the Services, industry, academia, and National laboratories in live/virtual/constructive (LVC) experimentation environments and in complex field experimentation events under real-world conditions. This approach significantly accelerates the identification and development of the most effective EW technologies while concurrently reducing developmental costs.

Significant advances in all areas impacting EW have resulted in new generations of threats that are challenging the U.S.’s traditional dominance in EW. EW E&I efforts address these challenges and also develop new technologies to ensure that U.S. warfighters maintain decisive overmatch offensive and defensive EW capabilities. EW E&I efforts specifically focus on areas where Service investments are lagging to accelerate the development and transition of multi-Service, multi-mission EW technologies.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: EW Enterprise Exploration and Innovation (EW E&I)	14.773	18.164	19.218
Description: Current EW E&I research thrusts include Passive Sensor Detection and Defeat (PSDD), Platform Self-Protection (PS-P), EW Technology Enablers (EW Tech), EW-Cyber Interface (EWCI), and EW Collaboration and Cognizance (EW C&C).			
Passive Sensor Detection and Defeat (PSDD): Modern integrated air defense systems (IADS) employ a variety of radar sensing technologies to detect, target and engage adversary aircraft. While classic IADS radars emitted radiofrequency radiation and collected the radiation that was reflected off targets within their field of view with the same aperture, computational advances have enabled passive (non-emitting) radar radiation receivers to capture and process the radar radiation reflected off targeted systems that was emitted by other radar emitters. Passive radar systems are thus capable of providing targeting solutions to engagement assets (missiles, aircraft, directed energy, etc.) even though they do not emit radar radiation. This makes these systems a much more complex threat to U.S. offensive systems because traditional EW countermeasures such as jamming cannot be employed			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603618D8Z / <i>Joint Electronic Advanced Technology</i>	Project (Number/Name) 245 / <i>EW Enterprise Exploration and Innovation</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>against these passive radars since they are largely undetected by our radar warning systems. This leaves U.S. aircraft confronted by IADS containing passive sensors vulnerable to unforeseen attacks. PSDD research identifies, explores and accelerates the maturing and demonstration of new technologies to provide defensive capabilities against passive detection/tracking/engagement sensor systems.</p> <p>Platform Self-Protection (PS-P): A wide variety of radiofrequency (RF) and electro-optical (EO) technologies are employed by modern militaries to detect, track, and engage attacking military systems. RF sensor systems including IADS radars, radars on ships, aircraft, ground, and naval vessels, and seekers on ballistic, cruise, air-to-air, surface-to-air missile are used to detect and provide targeting and engagement solutions to counter adversaries' military systems. EO systems have been incorporated into missile seekers and are also associated with high energy laser engagement systems for the same reasons. To ensure successful U.S. military actions, technologies that protect U.S. platforms and facilities against these new generations of much more capable RF and EO detection/targeting/engagement sensors and seekers are essential. This thrust identifies, explores, and accelerates the maturing and demonstration of new technologies to counter adversaries' advanced RF and EO sensor and seeker threats.</p> <p>Electromagnetic Warfare Technology Enablers (EW Tech): Significant advances in materials, electronics (including photonics, plasmonics, spintronics, magntronics, etc.), RF and communications sciences, optical and laser sciences, information and computational sciences, and quantum sciences are enabling new generations of extremely powerful applications in a wide variety of fields. For example, artificial intelligence and machine learning (AI/ML) technologies are beginning to impact electromagnetic spectrum (EMS) operations. The advantages that AI/ML approaches can provide are considerable, but multiple runs addressing the same scenarios often provide disparate results for both the same assets in the same scenarios and for different assets in different locations within the scenarios. Ascertaining the optimal employment tactics and strategies using AI/ML thus becomes difficult for offensive and defensive operations in both proactive and reactive EW modes. EW Tech research seeks to leverage the latest advances in all of these areas to enable commensurate advances in the EW and EW-Cyber warfighting capabilities.</p> <p>EW-Cyber Interface (EWCI): The ability to impact system logic using EW and other RF systems provides powerful new options for EW application. EWCI research efforts thus identify, explore, and accelerate the maturing and demonstration of new EW-Cyber-related technologies. Significant advances in the application of digital EW have resulted in new generations of threat systems that are challenging the United States' traditional dominance in these areas. EW E&I efforts address these threats and develop new technologies to ensure U.S. warfighters maintain decisive overmatch EW capabilities.</p> <p>EW Collaboration and Cognizance (EW C&C): EW C&C efforts focus on maintaining an awareness of global research and development (R&D) efforts impacting EMS, EW and EW-Cyber warfighting technologies; guiding, facilitating, ensuring the maximum levels of developmental collaboration across DoD; providing Office of the Secretary of Defense (OSD) oversight of technology development efforts across the DoD EW and EW-Cyber developmental communities; and providing decisional</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603618D8Z / <i>Joint Electronic Advanced Technology</i>		Project (Number/Name) 245 / <i>EW Enterprise Exploration and Innovation</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
insights to senior leaders and decision-makers so they can more effectively direct all Department EW and EW-Cyber technology development programs and processes.					
<p>FY 2022 Plans:</p> <p>Passive Sensor Detection and Defeat (PSDD):</p> <ul style="list-style-type: none"> • SILENT SWARM 22 (SS-22): Complete development and planning for the SS-22 field experimentation venue and conduct SS-22. SS-22 is a Naval Surface Weapons Center (NSWC) Crane led experimentation event focusing on small unmanned and semi-autonomous systems with advanced spectrum related capabilities. Specific emphasis is being placed on the evaluation of technologies for enhanced sensing, precision navigation and timing, and autonomy for both autonomous and semi-autonomous operations in SS-22. This includes developing and identifying Concepts of Operations (CONOPS), tactics, and other operational considerations for early technology readiness level (TRL) offerings will be a key component of this experimentation series. SS-22 will highlight Gray Zone operations as an initial focus. Government and industry technology inputs will be solicited for event participation. - SS-22 builds upon approaches and lessons learned from previous events and scenarios to produce threat representative architectures for red threat laydowns along with considerations for blue sensor integration. - SS-22 will be conducted in 4Q FY 2022. <p>Platform Self-Protection (PS-P):</p> <ul style="list-style-type: none"> • Next Generation (NextGen) Electro-Optical Countermeasures (EOCM) Study: Over the past decade, significant advances in optical sensors, processing, microelectronics, and systems integration have enabled new generations of extremely capable man-portable air defense system (MANPADS) and air-to-air (A2A) missiles to be developed. While U.S. countermeasures (CMs) to these classes of threats have advanced, foreign MANPADS and A2A missiles still pose significant threats to U.S. aircraft. The last comprehensive assessment of the EOCM area was completed in 2009, and the last major joint collaborative efforts were completed in FY 2010-2013 and FY 2015-2018. This effort will re-baseline Department aircraft self-protection EOCM development efforts and develop a roadmap to accelerate U.S. aircraft EOCM development efforts. <p>Electromagnetic Warfare Technology Enablers (EW Tech):</p> <ul style="list-style-type: none"> • Next Generation Fully Adaptive Radar (NG-FAR): The second and third proof-of-technology field demonstrations of NG-FAR will be completed in Q1 and Q4 of FY 2022. These demonstrations will get NG-FAR to TRL 6 and to buy down risk as an enabler for follow-on prototyping/validation and demonstration efforts by USD(R&E)/DDRE(AC). • Innovative Low-Cost Experimentation (LCE): Develop plans and conduct the first of a new series of LCE event at the Playas, New Mexico experimentation range. The initial LCE events will utilize and enhance the predictive and assessment capabilities of the JEAT PE-developed Digital Attack Surface Execution Environment (DASEE) nonkinetic battlespace comprehension and management tool to facilitate concepts of operations (CONOPS) development and exploratory wargaming. 					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603618D8Z / <i>Joint Electronic Advanced Technology</i>	Project (Number/Name) 245 / <i>EW Enterprise Exploration and Innovation</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> • CONCEAD Maturation: Cooperative and Networked Controlled Electronic Attack Development (CONCEAD) is a multi-Service (NSWC CRANE, AFRL/Ry, ARL/USA DEVCOM) prototyping and demonstration effort to demonstrate coherent multi-platform, multi-aperture EA capabilities for multiple Combatant Command users. CONCEAD was proposed but not selected as a FY 2022 Joint Capabilities Technology Demonstration (JCTD) effort because the initial capabilities demonstrated within CONCEAD were deemed to be too simplistic. This effort will mature and advance CONCEAD technologies and experiment within very complex field environments to enable CONCEAD to be selected as a JCTD effort in FY 2023. • Digital Attack Surface Execution Environment (DASEE) Transition: This effort will complete final development actions to enable the successful transition of the JEAT Program's DASEE capability to operational users. It includes the development and validation of new containers for wargaming and modeling and simulation. - DASEE Graphical User Interface (GUI) Upgrade: This effort will mature and integrate the Jupyter Notebook upgrade into DASEE to enhance DASEE's GUI and facilitate increased data access/assessment/utilization. • VIRTUAL STINGRAY 22: The complexity and highly classified nature of EW and EW-Cyber technologies and approaches severely limits their exploration in real-world highly complex congested-and-contested EMS environments. This significantly increases both developmental and validation costs for these important capabilities. This multi-Service effort will develop and employ an extremely advanced classified simulation environment to facilitate the exploration and advancement of new EW and EW-Cyber technologies. Utility will be maximized by anchoring simulated effects to physics-level codes and comparing results to laboratory and field measurements. <p>EW-Cyber Interface (EWCI):</p> <ul style="list-style-type: none"> • Precision RF-enabled Access & Effects for the IoT Environment (PRAETOR): The "internet of things" (IoT) environment controls a significant amount of extremely important day-to-day operations and capabilities including event monitoring, power management and data transfer and storage. Loss of IoT capabilities can thus significantly degrade a potential adversary's capabilities to generate and employ forces in both preemptive and responsive manners. This effort will begin exploring over-the-air RF-enabled cyber-attacks on IoT devices to negate or compromise their operation to enhance deterrence operations by U.S. forces. <p>EW Collaboration and Cognizance (EW C&C):</p> <ul style="list-style-type: none"> • Several hundred million dollars are spent each year to develop better EW and EW-Cyber capabilities for U.S. warfighters. EW C&C efforts supporting the OUSD(R&E)/Electronic Warfare and Countermeasures (EW&C) Directorate facilitate greater collaboration across these initiatives through work with planners and developers across the Services, National Laboratories, Industry, academia, and international defense partners. Participation in the EW Community of Interest facilitates these efforts and provides insights for decision-makers within OSD and the Services and the EW Executive Committee. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603618D8Z / <i>Joint Electronic Advanced Technology</i>	Project (Number/Name) 245 / <i>EW Enterprise Exploration and Innovation</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>• EW C&C efforts also enable the identification and development of collaboration opportunities, via JEAT's live, virtual and constructive experimentation venues.</p> <p>FY 2023 Plans:</p> <p>Passive Sensor Detection and Defeat (PSDD):</p> <p>• SILENT SWARM 23 (SS-23): Complete assessment and final reports for SS-22 and begin planning and development the SS-23 field experimentation venue. SS-23 will be conducted in 4Q FY 2023.</p> <p>• Characterization of Passive Systems (COPS) – Classified project in collaboration with PMR 51 and the FFRDCs.</p> <p>Electromagnetic Warfare Technology Enablers (EW Tech):</p> <p>• Magnetic Field Sensing (MFS): Assess the Josephson junction magnetic sensor to recreate the EMS from the magnetic field component thereby bypassing the need for an aperture enabling ultra wideband sensing.</p> <p>• Reconfigurable Intelligent Surfaces (RIS): Assess the feasibility of applying meta-surface materials to modify the radar scattering of surfaces for EW applications across multiple domains.</p> <p>• Dynamically Configurable Apertures (DCAs): Leverage the advances in additive manufacturing technology to dynamically adapt to changes in the EMS by dynamically controlling the size, frequency, gain and polarization of the RF front end and affiliated components.</p> <p>• Innovative Low-Cost Experimentation (LCE): Develop plans and conduct the second and third LCE event at the Playas, NM experimentation range. Continue leveraging EW capabilities in these events to explore CONOPS development and wargaming applications.</p> <p>• Spectrum Access Sensor for Situational analysis (SASSY): Congestion within the EMS significantly impacts military operations in a variety of important ways. Most importantly, frequencies that provide significant amounts of militarily-valuable information are coincident with civilian-use frequencies. To utilize this important information without adversely affecting civilian operations is thus extremely important for operational situational analysis. This effort will begin exploring cognitive RF technologies to enable cognitive radar applications within this congested EMS environment.</p> <p>• VIRTUAL STINGRAY 23 (VS-23): Building upon the results of VS-22, VS-23 will expand the numbers of users and capabilities involved and increase levels of anchoring of EW and EW enabled cyber effects in a secure virtual and constructive setting to real-world offensive EW and Cyber effects in a distributed and networked laboratory environments.</p> <p>EW-Cyber Interface (EWCI):</p> <p>• Preventing Blue Force Fratricide (PBFF): Applying AI/ML algorithms to more accurately identify signal in the EMS and discerning between blue systems from red systems in real time.</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603618D8Z / <i>Joint Electronic Advanced Technology</i>	Project (Number/Name) 245 / <i>EW Enterprise Exploration and Innovation</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> Precision RF-enabled Access & Effects for the IoT Environment (PRAETOR): Advancement and refinement of initial capabilities developed in FY 2022 will continue, culminating in several real-world in-the-field assessments of PRAETOR effects and their efficacy. <p>EW Collaboration and Coordination (EW C&C):</p> <ul style="list-style-type: none"> Continue FY 2022 OUSD(R&E) efforts to guide, shepherd, and oversee all EW and EW-Cyber technology development across the DoD. <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i></p> <p>The increase in funding will allow the JEAT program to address new EW and EW-Cyber warfighting challenges and provide new, leap-ahead EMS warfighting capabilities to ensure U.S. warfighters will always have decisive EW and EW-Cyber overmatch capabilities.</p>			
Accomplishments/Planned Programs Subtotals		14.773	18.164
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)					PE 0603648D8Z / Joint Capability Technology Demonstration (JCTD)							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	1,152.112	69.482	102.345	114.100	0.000	114.100	121.077	126.105	128.559	130.943	Continuing	Continuing
648: Joint Capability Technology Demonstration (JCTD)	1,152.112	69.482	102.345	96.537	0.000	96.537	103.647	109.231	111.529	113.760	Continuing	Continuing
649: Multi-Domain Demonstrations (MDD)	0.000	0.000	0.000	17.563	-	17.563	17.430	16.874	17.030	17.183	Continuing	Continuing

Note

New Start (Y/N): No

In FY 2022, all funding and investment areas in the Time Sensitive Targeting Defeat (TSTD) project code (P-722 within program element (PE) 0603338D8Z) will be incorporated into the Joint Capability Technology Demonstration PE for proper alignment and execution to support the new priorities of the Under Secretary of Defense for Research and Engineering (USD(R&E)). This project code has been renamed as Multi-Domain Demonstrations (MDD) to better reflect the objectives of the effort. This realignment reflects the FY 2023 Secretary of Defense Planning Guidance to develop a JCTD pathway to exercise and deliver critical capabilities to U.S. Indo-Pacific Command (USINDOPACOM) and U.S. European Command (USEUCOM) to curb peer competition in those regions. This funding realignment is reflected across the Future Years Defense Program (FYDP).

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Build Sustainable and Long-Term Advantage, and Build a Resilient Joint Force and Defense Ecosystem.

The mission of the Joint Capability Technology Demonstration (JCTD) Program Element, 0603648D8Z, is to address Combatant Command (CCMD) and Joint Warfighting operational gaps by executing prototypes and experiments, reducing technical risk, and conducting operational demonstrations in order to assess military utility against urgent / emergent warfighter needs. This congressionally mandated program serves as one of the few avenues for CCMDs to address their most pressing priority capability gaps and requirements, which often result from inadequate Service U.S.C. Title 10 investment in joint interoperability that achieve improved mission outcomes.

The JCTD PE puts capabilities into the hands of the Joint Warfighter one to two years sooner than would have been accomplished by the services alone. This is achieved using a CCMD sponsor for each project; leveraging service research and engineering laboratories, academia, and industry expertise; requiring partner funding; and executing the necessary steps for transition with service acquisition partners throughout the project life cycle. This methodology results in a 74 percent transition success rate, and solidifies the program's role as a technology catalyst, rapid capability provider, and transition-bridge between the USD(R&E) and the Undersecretary of Defense, Acquisition and Sustainment (USD(A&S)) offices.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603648D8Z I <i>Joint Capability Technology Demonstration (JCTD)</i>
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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	71.452	102.669	0.000	0.000	0.000
Current President's Budget	69.482	102.345	114.100	0.000	114.100
Total Adjustments	-1.970	-0.324	114.100	0.000	114.100
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.956	-			
• Adjustments to Budget Year	-	-	93.207	-	93.207
• Other Program Adjustments	-0.014	-	16.957	-	16.957
• Economic Assumption Adjustment	-	-	3.936	-	3.936
• FFRDC Reduction	-	-0.324	-	-	-

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603648D8Z / Joint Capability Technology Demonstration (JCTD)				Project (Number/Name) 648 / Joint Capability Technology Demonstration (JCTD)			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
648: Joint Capability Technology Demonstration (JCTD)	1,152.112	69.482	102.345	96.537	0.000	96.537	103.647	109.231	111.529	113.760	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2022, all funding and investment areas in the Time Sensitive Targeting Defeat (TSTD) project code (P-722 within program element (PE) 0603338D8Z) will be incorporated into the Joint Capability Technology Demonstration PE for proper alignment and execution to support the new priorities of the Under Secretary of Defense for Research and Engineering (USD(R&E)). This project code has been renamed as Multi-Domain Demonstrations (MDD) to better reflect the objectives of the effort. This realignment reflects the FY 2023 Secretary of Defense Planning Guidance to develop a JCTD pathway to exercise and deliver critical capabilities to U.S. Indo-Pacific Command (USINDOPACOM) and U.S. European Command (USEUCOM) to curb peer competition in those regions. This funding realignment is reflected across the Future Years Defense Program (FYDP).

A. Mission Description and Budget Item Justification

JCTD project selection is driven by the ability to accelerate transition of new prototyped capabilities to the Joint Warfighter that have strong CCMD and Joint Staff interest; cost share commitments from the Military Services and Defense Agencies; advanced technical readiness; and a well-defined and affordable transition path for long-term sustainment. Project proposals are selected following a deliberate process that leverages a wide-ranging stakeholder community that includes the CCMDs, Joint Staff, service science and technology communities, academia, industry, the intelligence community, and organizations within the Office of the Secretary of Defense. This selection process and the execution process previously described has resulted in a 74% transition rate, which is defined as a project moving into a new or existing program of record or residual prototypes utilized by the CCMDs and Joint Warfighter for immediate operational use. The final objective for the JCTD program is to maintain the United States' technological superiority across the range of military operations while reducing the cost of operations, facilitating joint interoperability, and allowing for the rapid insertion of new capabilities.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Dialable Effects Munition (DEM)	0.350	-	-	-	-
Description: Previously funded JCTD. DEM develops adjustability for air delivered bomb employment to allow adjustment to the munition while the aircraft is in flight. The bomb can be dialed in for localized, low collateral damage, penetration, blast/fragmentation, and area attack. DEM conducted successful flight tests in FY 2021 and received additional funding to expand the DEM technology to a second family of munitions. There is a strong possibility that a third munition will also use DEM technology significantly leveraging the initial DEM investment across the Joint enterprise. DEM will complete in FY 2022.					
Title: Expedient and Expeditionary Airfield Damage Repair (E-ADR)	0.600	-	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Description: Previously funded JCTD. E-ADR supports the National Defense Strategy's focus on resilient agile logistics and forward force maneuver. E-ADR provides an expeditionary low-logistics repair capability that maximizes the use of indigenous materials and readily available equipment. E-ADR also provides an expedient repair capability for aircraft runways in austere and dynamic base locations. In FY 2021, E-ADR conducted successful final military utility assessments. E-ADR transitioned to U.S. Naval Mobile Construction Battalions and the U.S. Air Force Life Cycle Management Center, with plans to pre-position the capability in specific areas of responsibility. E-ADR completed in FY 2021.						
Title: Integrated Manufacturing of Energetic Airframes (IMEA) Description: Previously funded JCTD. IMEA supports the National Defense Strategy by achieving joint lethality in contested environments. In FY 2021, IMEA completed operational demonstrations and a military utility assessment of the integrated airframe. IMEA will transition to the U.S. Army's Program Executive Office for Missiles and Space Close Combat Weapons Systems. IMEA will complete in FY 2022.		0.900	-	-	-	-
Title: Covert Long-Dwell Stratospheric Architecture (COLD STAR) Description: Previously funded JCTD. COLD STAR is a Stratospheric High Altitude Balloon capability that supports the National Defense Strategy's focus on command, control, communications, computers, intelligence, surveillance and reconnaissance; and addresses Combatant Command capability as defined by their Integrated Priority Lists. In FY 2021 COLD STAR completed its final operational demonstrations and military utility assessment. COLD STAR completed in FY 2021.		1.725	-	-	-	-
Title: Ultra High Frequency (UHF) Legacy Extension (ULX) Description: Previously funded JCTD. ULX supports the National Defense Strategy's focus on developing resilient, survivable networks from the tactical level up to strategic planning. ULX will address legacy communication systems across the DoD currently lacking resilience in congested and contested environments. These systems face near-term risk in shortfalls in UHF channel capacity; while wideband code division multiple access radios are fielded. ULX will resolve the legacy UHF shortfall by increasing total legacy UHF channel capacity worldwide. ULX also provides resiliency and eliminates legacy UHF interference through innovative ground signal processing. In FY 2021, ULX conducted two technical demonstrations and conducted a military utility assessment. ULX will transition to the Mobile User Objective System (MUOS) Program of Record. ULX will complete in FY 2022.		0.700	-	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Directed Energy Survivable Standoff Munitions (DESSM) Description: Previously funded JCTD. DESSM supports the National Defense Strategy’s focus on increased lethality in joint contested environments. DESSM will develop material solutions for protecting standoff munitions against DE countermeasures and weapons. DESSM will also utilize hardened munitions to reduce and eliminate weapon effectiveness zones. In FY 2021, DESSM completed their concept of the operations and tactics, techniques, and procedures; worked on DE hardened residual munitions; assessed performance and cost data; and conducted an operational demonstration as a part of a large-scale U.S. Indo-Pacific Command Exercise. DESSM will complete in FY 2022.		4.000	-	-	-	-
Title: Hoku-Kai Description: Previously funded JCTD. Hoku Kai addresses the Combatant Command’s urgent and emergent needs focused on fully networked command, control, and communications by providing a secure command, control, and communications platform against continuously growing adversarial threats. The JCTD will deliver assured maritime domain access and targeting using resilient undersea networks. In FY 2021, the Hoku-Kai JCTD conducted final critical design reviews, conducted integration tests of the nodes in classified locations, finalized the end-to-end network architecture, prepared and installed the infrastructure at demonstration sites, and completed an operational demonstration as a part of a large-scale U.S. Indo-Pacific Command exercise. Hoku-Kai will complete in FY 2022.		3.200	-	-	-	-
Title: Multi-domain Agile Navigation and timing Network Automation (MANNA) Description: Previously funded JCTD. MANNA addresses the Combatant Command’s urgent and emergent needs focused on fully networked command, control and communications. MANNA will demonstrate a global position, navigation and timing system of laser communications (“lasercom”) with secure, high-rate exfiltration of intelligence data from an aerial platform to low earth orbit space assets. In FY 2021, MANNA conducted space-to-air and space-to-ground technical demonstrations and operational demonstrations. MANNA will transition the initial capabilities document, testing results of the military utility assessment, verification of models, and three lasercom terminals to the Big Safari program of record via the U.S. Air Force Research Laboratory. MANNA will complete in FY 2022.		1.600	-	-	-	-
Title: Maritime Centric Skywave Over-the-Horizon Radar (MASOR) Description: Previously funded JCTD. MASOR supports the National Defense Strategy’s focus on the command, control, communications, computers, intelligence, surveillance and reconnaissance, and fully		1.800	1.500	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
networked command, control and communications. MASOR provides a near constant wide-area maritime detection and monitoring capability for both air and maritime targets which will degrade an adversary's ability to remain undetected within the southern approach. In FY 2021, MASOR finalized transit systems plans and began installation of digital receivers. FY 2022 Plans: MASOR will conduct an operational demonstration and military utility assessment (MUA). Upon successful MUA, MASOR will transition to the existing Relocating Over the Horizon Radar (OTHR) Texas system via Forces Surveillance Support Center. FY 2022 to FY 2023 Increase/Decrease Statement: The JCTD will complete in FY 2022.						
Title: Resilient Expeditionary Agile Littoral Logistics (REALL) Description: Previously funded JCTD. REALL supports the Contested Logistics mission priority area and the National Defense Strategy's focus on forward force maneuver and posture resilience. REALL will demonstrate capabilities to enable a distributed network of fuel distribution and logistics nodes in support of emerging operational concepts. These systems will operate within the arc of enemy fires with significantly less risk than traditional naval platforms due to their distributed nature. In FY 2021, REALL completed systems integration and testing, technical demonstrations, and operational demonstrations. FY 2022 Plans: REALL will finalize the concept of operations and complete a military utility assessment. REALL will transition the platform, VTOL kit, and fuel subsystem technical documentation to Naval Facilities Engineering Command (NAVFAC) Expeditionary Programs Office Sealift program; Naval Beach Group inventories via NAVFAC Expeditionary Programs Office; and Office of the Chief of Naval Operations, Expeditionary Warfare (OPNAV N95) and Strategic Mobility and Combat Logistics (OPNAV N42). FY 2022 to FY 2023 Increase/Decrease Statement: The JCTD will complete in FY 2022.		3.925	3.000	-	-	-
Title: Automating Indications and Warnings (I&W) for Operational Awareness (REDLINE) Description: Previously funded JCTD. REDLINE supports the National Defense Strategy's focus on military applications of machine learning to gain a competitive military advantage. REDLINE will leverage machine learning to provide CCMDs the ability to conduct automated order of battle in denied areas. In FY 2021,		3.000	2.500	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
REDLINE continued to scale performance to support global event detection and classification, and provided open applications, programming, and interfaces to facilitate interoperability with other command and control systems. FY 2022 Plans: REDLINE will conduct further operational demonstrations and its military utility assessment (MUA). REDLINE will transition to the Defense Intelligence Agency’s Foundational Intelligence Modernization effort as a program of record. FY 2022 to FY 2023 Increase/Decrease Statement: The JCTD completes in FY 2022.						
Title: Resilient Logistics Description: Previously funded JCTD. Resilient Logistics supports the Contested Logistics mission priority area and the National Defense Strategy's focus on forward force maneuver and posture resilience. Resilient Logistics will provide kitted solutions to increase the survivability of expeditionary and permanent logistical support networks in an Anti-Access/Area Denial (A2/AD) environment. Upon completion of the JCTD, residual operational prototype kits for Camouflage, Concealment, and Deception (CC&D) mission requirements will be available for immediate fielding. In FY 2021, the JCTD conducted technical demonstrations (TD) of potential solutions, and executed an operationally-relevant scenario to inform the down-select of optimal solutions to be included in a combined kit. FY 2022 Plans: Resilient Logistics will Develop the concept of operations and tactics, techniques, and procedures for the kitted solution and conduct a comprehensive Military Utility Assessment (MUA) with operational units at an appropriate exercise venue. FY 2022 to FY 2023 Increase/Decrease Statement: The JCTD completes in FY 2022.		2.000	2.250	-	-	-
Title: Analytic Threat Observation, Materialistic Identification, Classification, and Attribution (ATOMICA) Description: Previously funded JCTD. ATOMICA supports the National Defense Strategy's focus on providing non-intrusive, real time identification of threats to support the Joint Force’s secure maneuverability through both land and sea. ATOMICA provides a portable, self-contained sensor system that will provide an unprecedented ability to materialistically determine the contents of an unknown object. The sensor will interrogate objects with		2.500	1.900	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
a short standoff distance without touching, opening, or disturbing the targeted object. The ATOMICA sensor will be integrated onto various unmanned platforms, to include unmanned ground vehicles (UGV) and unmanned, remotely operated vehicles (ROV) for both terrestrial and underwater environments. In FY 2021, the ATOMICA JCTD began developing a ruggedized developmental prototype and completed an initial technical demonstration in a controlled environment. FY 2022 Plans: In FY 2022, ATOMICA will develop a concept of operations (CONOPS) and tactics, techniques, and procedures (TTP) for fieldable/operational prototypes. FY 2022 to FY 2023 Increase/Decrease Statement: The JCTD will conduct their final operational demonstration and Military Utility Assessment in FY 2023, decreasing expenditures requirements for that fiscal year.						
Title: Secure Tactical Advanced Mobile Power (STAMP) Description: Previously funded JCTD. STAMP supports the National Defense Strategy's mission priority of Contested Logistics. STAMP will integrate power generation, distribution, battery storage, metering, control systems, and on-board vehicle power from mobile tactical platforms into an AC/DC micro-grid to enhance resiliency, mobility, and flexibility of tactical units to execute distributed cross domain maneuvers in multi-domain operations. In FY 2021, STAMP conducted a technical demonstration; confirmed safety test results; and finalized vehicle charging (VC) Integration Design. FY 2022 Plans: STAMP will conduct Operational Demonstrations for a micro-grid, with mobile tactical charging and energy storage integration; transition integration; and safety confirmation for Family of Medium Tactical Vehicles (FMTV) micro-grid system. STAMP will transition components and other hardware to Programs of Record for Power Distribution Illumination System, Electrical (PDISE) and FMTV. Operational prototypes will be delivered to Program Management (PM) office Terminal High Altitude Area Defense (THAAD) and PM Mission Command. STAMP will complete in FY 2022. FY 2022 to FY 2023 Increase/Decrease Statement: The JCTD completes in FY 2022.		4.900	2.500	-	-	-
Title: Autonomous Maritime Patrol Craft (AMPA)		1.235	2.100	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>Description: Previously funded JCTD. AMPA supports the National Defense Strategy by developing an unmanned militarized version of the world’s largest solar aircraft, the Solar Impulse. The resulting Skydweller aircraft will be designed to stay airborne for more than 90 days with excess electrical power available to simultaneously operate a suite of sensors, communications, Navigation, and Electronic Warfare (EW) sub-systems. This technological leap will allow a single Skydweller aircraft to more effectively perform the mission of numerous manned & unmanned ISR/configurable assets, eliminate risk to human pilots, and provide a level of persistence not available anywhere else in the military inventory. In FY 2021, AMPA completed an aircraft integrity flight test and conducted engineering activities to integrate advanced fly-by-wire technology, autonomous flight control system, and vehicle management systems into the Skydweller aircraft.</p> <p>FY 2022 Plans: AMPA will obtain appropriate flight authorizations for conducting flight readiness and safety reviews. The JCTD will execute a technical demonstration to demonstrate autonomous, long-endurance flight of the Skydweller aircraft and basic system operations. Evaluation of flight results will culminate in a decision on whether to fund advanced sensor payload integration in the long-endurance aircraft.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: There are no funds requested in FY 2023.</p>						
<p>Title: Automated Construction of Expeditionary Structure (ACES)</p> <p>Description: Previously funded JCTD. ACES provides Combatant Commands the capability to quickly provide mobility and force protection for deployed Joint Warfighters. Military combat engineer units lack the capability to enable rapid construction, route repair and gap crossing to establish and sustain lines of communications. ACES will provide an automated 3D printer to construct gap crossings, obstacles, and force protection positions using locally available concrete and other materials at a pace that adversaries cannot match. In FY 2021, ACES conducted technical and operational demonstrations with multiple services.</p> <p>FY 2022 Plans: ACES will conduct a Military Utility Assessment (MUA) and deliver fieldable prototypes in theater to support Joint Warfighter battlefield needs. Prototypes will transition to Programs of Record (POR) at U.S. Army Facilities Component Systems, U.S. Navy Engineering Expeditionary Warfare Center (EXWC), and U.S. Marine Corps Systems Command.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>		2.930	1.300	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
The JCTD completes in FY 2022.						
Title: Prometheus Emerald Description: Prometheus Emerald was a FY 2021 new start JCTD. Prometheus Emerald supports the National Defense Strategy by delivering a proof of concept Artificial Intelligence (AI) collection management and tasking capability to allow Military Intelligence personnel to automate AI workflows. In FY 2021, Prometheus Emerald collected threat imagery, developed AI models, and deployed AI Hardware. FY 2022 Plans: The JCTD will conduct technical demonstrations of AI hardware and models, conduct an operational demonstration and military utility assessment, and transition to the Army Tactical Intelligence Targeting Access Node (TITAN) program of record. FY 2022 to FY 2023 Increase/Decrease Statement: The JCTD completes in FY 2022.		1.500	2.900	-	-	-
Title: Pacific Ecosystem for Cyber (PEcoC) Description: PEcoC was a FY 2021 new start JCTD. PEcoC supports the cybersecurity requirements identified in the FY 2021 National Defense Authorization Act, and the Combatant Command's Integrated Priority Lists. PEcoC provides an information advantage through application of integrated artificial intelligence (AI) and machine learning (ML) techniques that improves cyber threat identification and response while integrating disparate national cybersecurity programs into the Pacific ecosystem. In FY 2021, PEcoC achieved deployment of prototype high-performance ML algorithms and storage system, establishing a network link between U.S. Cyber Command and U.S. Indo-Pacific Command through a Cloud Data Pipeline. FY 2022 Plans: PEcoC will incorporate additional threat and malicious behavior into ML algorithms and software models while continuing development and deployment of deep packet inspection models that look for data exfiltration into DoD operational platforms. PEcoC also plans to deploy classified prototype high-performance ML system to Naval Computer and Telecommunications Area Master Station, Pacific. FY 2022 to FY 2023 Increase/Decrease Statement: The JCTD completes in FY 2022.		1.400	3.200	-	-	-
Title: Passive Optical Spectrum Control and Exploitation (POSCE)		2.600	2.900	2.640	-	2.640

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>Description: Previously funded JCTD. POSCE supports the National Defense Strategy’s emphasis on command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) and the OUSD(R&E) prioritization of advanced electronic warfare. Additionally, this novel sensing mechanism will provide ISR updates in response to operational challenges in anti-access/area denial environments – Additional details are CLASSIFIED. In FY 2021, the POSCE JCTD conducted a technical demonstration by utilizing innovative sensing methods to augment persistent Intelligence, Surveillance, & Reconnaissance (ISR) in maritime environments and along terrestrial choke points.</p> <p>FY 2022 Plans: In FY 2022, POSCE will begin establishing requirements for automated data processing and for packaging of hardware components. The JCTD will also leverage other partner programs to develop Concept of Operations (CONOPS) and system functionality that maps software/hardware to performance requirements, and complete their first operational demonstration.</p> <p>FY 2023 Base Plans: In FY 2023, POSCE will execute operational demonstrations and a military utility assessment. The JCTD completes in FY 2023.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The JCTD completes in early FY 2023.</p>						
<p>Title: Reliable Transmission over HF (NORTH)</p> <p>Description: Previously funded JCTD. NORTH directly supports the National Defense Strategy’s focus on command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) and fully networked command, control and communications. In FY 2021, NORTH conducted a technical demonstration in simulated conditions which will demonstrate an ad hoc high frequency (HF) mesh networking system that operates through a range of contested environments to enhance fully networked C3 (FNC3), including Resilient Command and Control (RC2) and Nuclear Command, Control and Communications (NC3). NORTH will integrate with the Navy’s wideband HF mesh networking system and the Air Force’s digital HF radios and repeaters to optimize joint information transport datalinks based on sense and respond (S&R) of the spectral environment. All three systems together provide an enterprise solution which will increase operational effectiveness of resilient C3 in anti-access/area-denial environments.</p> <p>FY 2022 Plans:</p>		0.800	2.970	0.840	-	0.840

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
NORTH plans to develop and integrate roll-on/roll-off equipment suites upon joint Service fixed and mobile platforms and demonstrate resilient command and control capability in contested environments. FY 2023 Base Plans: NORTH will execute its military utility assessment in FY 2023. FY 2022 to FY 2023 Increase/Decrease Statement: This JCTD will complete in the first half of FY 2023, thereby reducing the funding required.						
Title: Quicksink Description: Quicksink was a FY 2021 new start JCTD. Quicksink is intended to reduce air delivered assets required for anti-surface warfare (ASuW) operations by increasing lethality; decreasing costs, and improving maritime mining capabilities. Quicksink held a kickoff meeting in FY 2021 and is completing the implementation directive that will direct successful completion of the JCTD. Quicksink is also identifying target vessels and exercise opportunities for testing of the capability. FY 2022 Plans: Quicksink will finish development of the payload and guidance systems and conduct technical demonstrations. FY 2023 Base Plans: Quicksink will exectue technical and operational demonstrations. FY 2022 to FY 2023 Increase/Decrease Statement: Additional prototype development and operational demonstrations lead to higher costs in FY 2023. The JCTD is scheduled to complete in FY 2024.		1.100	2.400	4.355	-	4.355
Title: Raging Parakeet (RP) Description: RP was a FY 2021 new start JCTD. Combatant Commands (CCMD) lack the ability to rapidly analyze vast amounts of Intelligence, Surveillance, and Reconnaissance (ISR) data to quickly locate hard-to-find targets with a high degree of accuracy. RP will utilize advanced Artificial Intelligence (AI)/Machine Learning (ML) algorithms and sensor fusion to decrease manpower requirements and simultaneously increase the accuracy of high-priority target identification. In FY 2021, RP completed its Implementation Directive, completed its Management Plan, and identified the integration platform. FY 2022 Plans:		1.550	7.100	5.250	-	5.250

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
RP will gather needed data sets, develop an initial set of algorithms, establish open architecture (OA) standards, complete standards development, develop a prototype processor based on RP standards, create fusion and cross-cueing algorithms, and perform technical demonstrations. FY 2023 Base Plans: RP will execute operational demonstrations and its military utility assessment. FY 2022 to FY 2023 Increase/Decrease Statement: The JCTD will complete in FY 2023.						
Title: Stratospheric Capability Architecture Development (SCAD) Description: SCAD was a FY 2021 new start JCTD. SCAD supports the National Defense Strategy by delivering materiel solutions to the United States Army (USA) and United States Special Operations Command (USSOCOM) for acquisition and sustainment. SCAD will develop, demonstrate, and assess an unmanned aerial systems platform with stratospheric payloads that provide Ground Moving Target Indicator (GMTI) Synthetic Aperture Radar (SAR), Signals Intelligence (SIGINT), and communications relay capabilities. In FY 2021 SCAD developed open-system payload architecture and interface standards, and established Project Agreements (PA) with the United Kingdom (UK) and Australia to demonstrate and share project information. FY 2022 Plans: SCAD will develop concept of operations and conduct technical and operational demonstrations. FY 2023 Base Plans: SCAD will execute its military utility assessment. FY 2022 to FY 2023 Increase/Decrease Statement: Multiple operational demonstrations and the military utility assessment planned for FY 2023 will result in higher costs. This JCTD will complete in FY 2023.		0.600	1.450	2.100	-	2.100
Title: Pathfinder Description: Pathfinder was a FY 2021 new start JCTD. Pathfinder supports the National Defense Strategy by delivering U.S. Northern Command (USNORTHCOM) and North American Aerospace Defense Command (NORAD) a prototype Homeland Defense Data Ecosystem (HDDE) that fuses hundreds of Terabytes (TB) of data and provides a synthesized analytical solution. In FY 2021, Pathfinder gathered initial data sets and		0.850	2.000	4.500	-	4.500

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
prototyped artificial intelligence and machine-learning algorithms and processes. The JCTD also participated in the Global Information Dominance Exercise (GIDE) series as a risk reduction event and technical demonstration. FY 2022 Plans: Pathfinder will codify HDDE architecture and complete machine-learning based pattern of life and course of action algorithm development. FY 2023 Base Plans: Pathfinder will execute operational demonstrations and its military utility assessment. FY 2022 to FY 2023 Increase/Decrease Statement: Multiple technical and operational demonstrations intended for the next fiscal year will increase costs for FY 2023. This JCTD will complete in FY 2023.						
Title: Cybersecurity for Robotic and Autonomous Systems Hardening (CRASH) Description: CRASH was a FY 2021 new start JCTD. The Department of Defense (DoD)’s deployed Robotic Autonomous Systems (RAS) face pervasive threats to adversary hacking at multiple touch points that, if left unsecured, could potentially allow adversaries to manipulate DoD Forces without Joint Warfighter knowledge and create climates of permanent uncertainty and distrust within the Joint Warfighter community toward RAS assets. CRASH will tailor RAS software solutions to provide deep and layered cyber defenses against multi-vector cyberattacks from existing and emerging threats to allow completion of autonomous missions in contested battlefields. In FY 2021, CRASH completed its Implementation Directive and Management Plan. FY 2022 Plans: CRASH will develop and cyber-test RAS platforms with integrated secure software, intrusion protection, and secure communications. FY 2023 Base Plans: CRASH will execute its military utility assessment. FY 2022 to FY 2023 Increase/Decrease Statement: The JCTD will complete in early FY 2023.		1.700	2.600	2.000	-	2.000
Title: Joint Targeting Support (JTS) Description: JTS was a FY 2021 new start JCTD. JTS supports the National Defense Strategy’s emphasis on increased lethality. JTS will reduce the sensor to shooter timeline and increase the rate of target identification		2.450	6.100	5.655	-	5.655

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Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603648D8Z I Joint Capability Technol ogy Demonstration (JCTD)		Project (Number/Name) 648 I Joint Capability Technology Demonstration (JCTD)		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
and engagements by leveraging resources across services, agencies, and coalition partners. Additionally, JTS will automate joint target development for deep fires missions by developing and integrating machine learning analytics with joint and service specific information systems and Intelligence, Surveillance, and Reconnaissance (ISR) networks. JTS will simultaneously build and refine numerous user and machine nominated target decks by employing distributed processing and fusion analytics and augmenting the Joint Automated Deep Operations Coordination System (JADOCs) to improve the target development process across echelons and services. In FY 2021, JTS defined requirements, developed a use case, and created and reviewed system design. FY 2022 Plans: JTS will develop analytics, graphic user interface, and exploitation and correlation of joint forces data and conduct a technical demonstration. FY 2023 Base Plans: JTS will execute operational demonstrations and conduct its military utility assessment. FY 2022 to FY 2023 Increase/Decrease Statement: The JCTD will complete in FY 2023.						
Title: Aerial Port of the Future (APOF) Description: APOF was a FY 2021 new start JCTD. Aerial ports and air transportation expeditionary operations are constrained by poorly performing and unlinked Information Technology (IT) systems, outdated command, control, and communications networks, and physical handling of critical classes of supply. To solve these problems, APOF will develop, integrate, and test emerging capabilities at Aerial Ports by providing a logistics common operating picture for planning, processing, and managing Joint Force cargo; an integrated automated system to manage personnel, cargo, and munitions; and man/unmanned materiel handling equipment to rapidly load sustainment to global air mobility assets. In FY 2021, APOF integrated automated port management systems and tools to synchronize operations-level planning. FY 2022 Plans: The JCTD will leverage high-impact improvements to IT infrastructure for tactical awareness of the Aerial Port, complete the spiral for IT Infrastructure Development, and start two new spirals: one for automated systems with portable computing and another for the integration of autonomy and machine learning with advanced data analytics. FY 2023 Base Plans:		1.567	2.700	4.250	-	4.250

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603648D8Z I Joint Capability Technology Demonstration (JCTD)		Project (Number/Name) 648 I Joint Capability Technology Demonstration (JCTD)		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
The JCTD will complete additional spirals, select a package of aerial port capabilities, and execute operational demonstrations.						
FY 2022 to FY 2023 Increase/Decrease Statement: Additional technical and operational demonstrations in FY 2023 lead to higher costs. This JCTD completes in FY 2024.						
Title: JCTD Concept Development/Developmental and Operational Prototypes Description: Continually funded effort. This funding allocation is to provide funding for future fiscal year new-start JCTDs. The JCTD program will select new projects as developmental and operational prototypes, in alignment with the National Defense Strategy (NDS) and Combatant Command (CCMD) Integrated Priority Lists (IPL). Senior representatives from each CCMD, Service, and Joint Staff will participate in the submission, initial review, and down-selection of JCTDs. The USD(R&E) executive leadership will review final selections before making a final recommendation for Congressional approval. Selected projects will leverage networks within the global research and engineering enterprise to include government labs and integration facilities, depots, academia, as well as traditional and non-traditional technology providers. Prototypes will utilize best practices to satisfy joint and cross-cutting needs that directly address the CCMDs' technology/capability gaps as identified in their respective IPLs. The JCTD office will work with the Services to identify means to streamline prototype transition into the acquisition systems where appropriate. FY 2022 Plans: Fund the follow-on efforts for projects started in FY 2021. Select advanced prototyping activities as new starts in FY 2022 that support the NDS and the USD(R&E) priorities. FY 2023 Base Plans: Fund the follow-on efforts for projects started in FY 2022. Select advanced prototyping activities as new starts in FY 2023 that support the National Defense Strategy and the USD(R&E) priorities. FY 2022 to FY 2023 Increase/Decrease Statement: This line is dedicated to reflect both funding for FY 2023 new-start projects and funding tails from projects begun in FY 2022Once projects are selected, funding is subtracted from this line during the years of execution (FY 2022 / FY 2023) and is accounted for in projects detailed separately throughout the R-2. In previous years,		0.000	16.032	45.533	-	45.533

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022			
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603648D8Z / Joint Capability Technology Demonstration (JCTD)	Project (Number/Name) 648 / Joint Capability Technology Demonstration (JCTD)			
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
funding for new-starts was approximately 30 percent of the annual appropriation; however, with recent budget reductions to this PE, funding for new-starts is approximately 18 percent of the annual appropriation.						
Title: Combatant Commander (CCMD) Support, Capability Transition and Strategic Project Operational Management Description: Continuously funded effort. This effort is comprised of three programs that support the entire JCTD Program. The three programs are (1) CCMD direct liaison support, (2) JCTD pre-transition and (3) Program Integration Office for execution of select, classified projects. (1) CCMD direct liaison support: The CCMDs are essential in specifying capability needs, project identification, demonstration venues, military utility assessment, and transition of JCTDs. The JCTD program provides direct support to CCMDs enabling them to provide an on-site JCTD operational manager. (2) JCTD pre-transition: In some cases, Service or Agency partner transition funding is not available for one to two years following the JCTD demonstration phase. In such cases, where there is a clear transition and the need to sustain the capability for a short time prior to availability of Service or Agency transition funds, the JCTD pre-transition funds may be used to meet that need. (3) Program Integration Office: Executes a select number of highly classified projects in areas such as time sensitive targeting (TST), electronic miniaturization, electronic countermeasures, advanced mobile ad hoc network communications, space situational awareness intelligence surveillance and reconnaissance, sensor platforms and communications, and persistence surveillance. FY 2022 Plans: Provide CCMD direct participation to enable CCMD staff participation in identifying and executing developmental and operational prototypes. Identify and execute projects selected by the prototyping senior steering group. Sustain selected projects until program of record funds are received. Execute a limited number of classified projects' military utility assessments. FY 2023 Base Plans: Provide CCMD direct participation to enable CCMD staff participation in identifying and executing developmental and operational prototypes. Identify and execute projects selected by the prototyping senior steering group. Sustain selected projects until program of record funds are received. Execute a limited number of classified projects' military utility assessments. FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.		18.000	18.737	19.414	-	19.414
Title: Time-Sensitive Target Defeat Focus Area (TSTD)		-	14.206	0.000	-	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603648D8Z I Joint Capability Technology Demonstration (JCTD)		Project (Number/Name) 648 I Joint Capability Technology Demonstration (JCTD)		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>Description: This project addresses the need for distributed, rapidly-deployed capabilities that can provide persistent sensing to Find, Fix, and Finish time-sensitive threats by integrating prototypes and experiments into a series of multi-domain operational demonstrations. Demonstrations focus on evaluating how the Joint Force can leverage modernization technologies, commercial space-based capability, and operationalization of the stratosphere to refine hypersonic and long-range fire kill chains to counter time-sensitive targets.</p> <p>FY 2022 Plans: In FY 2022, TSTD will execute Joint-Combined Demonstration and Experimentation Campaigns (JCDEC) and TRIPPWIRE into two joint multi-domain demonstrations exercises, such as Valient Shield 22, Talisman Sabre, or Pacific Europe/Pacific Defender to evaluate prototypes and experiments operational utility in operationally relevant environments with direct warfighter involvement and feedback. Two JCDEC and TRIPPWIRE risk reduction demonstration events will be conducted prior to the exercises to ensure the prototypes and experiments are operationally feasible. A Counter-Stratospheric Operations experiment will be conducted within TRIPPWIRE. An all-domain joint demonstration will incorporate prototypes from land, air, sea, cyberspace, space, stratosphere, and electronic warfare to evaluate multi-path kill webs.</p> <p>FY 2023 Base Plans: In FY 2023, TSTD will be renamed as Multi-Domain Demonstrations (MDD) and will fall under the JCTD program element as project code 649.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funds re-aligned to new project code (P-649) Multi-Domain Demonstrations (MDD) within the JCTD program element 0603648D8Z.</p>						
Accomplishments/Planned Programs Subtotals		69.482	102.345	96.537	-	96.537
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
Upon project closeout, a JCTD has three possibilities:						
1) Transition as Capability Delivery (Operational Prototype)						

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603648D8Z / <i>Joint Capability Technology Demonstration (JCTD)</i>	Project (Number/Name) 648 / <i>Joint Capability Technology Demonstration (JCTD)</i>
<p>-To a new or existing Program of Record -As a residual leave behind for immediate operational use -Or both</p> <p>2) Transition as Capability Enabler (Developmental Prototype) -Informs further acquisition programs and/or requirements development</p> <p>3) No Transition -Requirements change or no longer valid -Did not meet deliverables as planned</p> <p>The integrated management team on a JCTD includes an operational manager from a CCMD, a technical manager from service research and engineering labs, and a transition manager from a program executive office. This ensures that transition is planned for throughout the lifecycle of the project, and is a major reason for the 74% JCTD transition rate.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603648D8Z / Joint Capability Technol ogy Demonstration (JCTD)				Project (Number/Name) 649 / Multi-Domain Demonstrations (MDD)			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
649: Multi-Domain Demonstrations (MDD)	0.000	0.000	0.000	17.563	-	17.563	17.430	16.874	17.030	17.183	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2022, all funding and investment areas in the Time Sensitive Targeting Defeat (TSTD) project code (P-722 within program element (PE) 0603338D8Z) will be incorporated into the Joint Capability Technology Demonstration PE for proper alignment and execution to support the new priorities of the Under Secretary of Defense for Research and Engineering (USD(R&E)). This project code has been renamed as Multi-Domain Demonstrations (MDD) to better reflect the objectives of the effort. This realignment reflects the FY 2023 Secretary of Defense Planning Guidance to develop a JCTD pathway to exercise and deliver critical capabilities to U.S. Indo-Pacific Command (USINDOPACOM) and U.S. European Command (USEUCOM) to curb peer competition in those regions. This funding realignment is reflected across the Future Years Defense Program (FYDP).

A. Mission Description and Budget Item Justification

This project addresses the need for distributed, rapidly-deployed capabilities that can provide persistent sensing to Find, Fix, and Finish time-sensitive threats by integrating prototypes and experiments into a series of Joint, multi-domain operational experiments. Demonstrations focus on evaluating how the Joint Force can leverage modernization technologies, commercial space-based capability, and operationalization of the stratosphere to refine hypersonic and long-range fire kill chains and Long Range Precision Strike to counter time-sensitive targets. Integrating these prototype capabilities with major exercises enhances the operational military utility assessments in real-world, multi-domain venues and satisfies additional service requirements leading to transition of these capabilities. The project integrates coalition participation within the Pacific to enable coalition warfighting techniques across forces.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Multi-Domain Demonstrations (Project Code 649)	0.000	0.000	17.563	0.000	17.563
Description: This project addresses the need for distributed, rapidly-deployed capabilities that can provide persistent sensing to Find, Fix, and Finish time-sensitive threats by integrating prototypes and experiments into a series of Joint, multi-domain operational demonstrations. Demonstrations focus on evaluating how the Joint Force can leverage operational prototypes, commercial space-based capability, and operationalization of the stratosphere to refine hypersonic and long-range fire kill chains to counter time-sensitive targets. Integrating these prototype capabilities with major exercises enhances the military utility assessments in real-world, multi-domain venues and satisfies additional service requirements leading to transition of these capabilities.					
FY 2022 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022	
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603648D8Z / <i>Joint Capability Technology Demonstration (JCTD)</i>		Project (Number/Name) 649 / <i>Multi-Domain Demonstrations (MDD)</i>	

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>N/A. See Project Code 648.</p> <p><i>FY 2023 Base Plans:</i> Coordinate with CCMDs and the services to integrate prototypes and experiments with FY 2023 Joint Exercises such as Austere Challenge, Valiant Shield, and Northern Edge. Support assessment and transition activities following completion of the exercises.</p> <p><i>FY 2023 OCO Plans:</i> N/A</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> Increase in funds from FY 2022 to FY 2023 due to additional prototype experiments in large scale, multi-domain exercises.</p>					
Accomplishments/Planned Programs Subtotals	0.000	0.000	17.563	0.000	17.563

C. Other Program Funding Summary (\$ in Millions)
 N/A

Remarks

D. Acquisition Strategy
 This project leverages the DoD's most efficient and effective acquisition approaches for rapid prototyping to align with the Department modernization priorities. Prototyping partners include small businesses and non-traditional performers, industry, Federally Funded Research and Development Centers, and University Affiliated Research Centers.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)					PE 0603662D8Z / Networked Communications Capability							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	5.692	2.975	3.168	0.000	3.168	3.253	3.334	3.415	3.485	Continuing	Continuing
663: Network Communications Analysis	-	5.692	2.975	3.168	0.000	3.168	3.253	3.334	3.415	3.485	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Departments initiatives to Build a Sustainable and Long-Term Advantage, and Build a Resilient Joint Force and Defense Ecosystem.

Fielded communications infrastructure for the Department of Defense (DoD) faces a variety of challenges including threats from electromagnetic, cyber, and kinetic sources among others. As more of this infrastructure becomes virtualized in cloud and embedded systems, the ability to rapidly protect and reconstitute this infrastructure is increasingly important, particularly in situations where both commercial and DoD infrastructures are used. The Network Communications Capability Program (NCCP) strives to enable such resilience with a strategy that leverages and develops rapidly reconfigurable and deployable solutions from the physical, to network, to applications layers of a communications stack. Such solutions will leverage software and hardware that are agile in their ability to be reconfigured and managed in contested environments both at the tactical edge and in the enterprise strategic contexts.

Most Department of Defense (DoD) missions are critically reliant on communications infrastructure, particularly in the context of command and control systems. The NCCP program strives to protect such critical missions at all layers of communications system functionality using a cost effective and automated approach for terrestrial, maritime, air, and space missions. Since most components of a communications system are increasingly being deployed using software, automated strategies of enabling physical layer, network layer, application layer interoperability, and rapid re-configurability are critical. Methods that dynamically allow multiple types of waveforms to be used in concert with multiple networking protocols, on hardware platforms that can handle a diverse set of protocols and capabilities are important. Because most of these capabilities will be delivered as communications services, the ability to analyze and rapidly reconstitute these services to manage the mission and inherent system complexities are critical, particularly when such missions are developed in large scale. Such complex system integration requires modern software and hardware practices and automated system repair capabilities to enable affordable, resilient operation in contested spectrum challenged DoD environments.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603662D8Z I <i>Networked Communications Capability</i>
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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	5.882	2.984	0.000	0.000	0.000
Current President's Budget	5.692	2.975	3.168	0.000	3.168
Total Adjustments	-0.190	-0.009	3.168	0.000	3.168
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.189	-			
• Other Reprogramming	-0.001	-	-	-	-
• FFRDC	-	-0.009	-	-	-
• Adjustments to Budget Year	-	-	3.058	-	3.058
• Economic Assumption	-	-	0.110	-	0.110

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603662D8Z / Networked Communications Capability				Project (Number/Name) 663 / Network Communications Analysis			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
663: Network Communications Analysis	-	5.692	2.975	3.168	0.000	3.168	3.253	3.334	3.415	3.485	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Threats to communications systems come from a combination of sources today from electromagnetic, cyber, and kinetic to name a few. Because DoD communication systems are highly distributed, the ability to rapidly model, measure, and manage these threats in the context of missions being conducted is critical. In order to accomplish this approach, a combination of new methods must be developed, including automated and flexible methods in continuous integration and delivery of communications software, virtualized and interoperable communications layers, which can rapidly shift between the DoD and commercial systems, detailed ability to model the interactions between these components, and flexible hardware solutions that can absorb a wide variety of communications protocols and techniques. Additionally, machine learning methods that enable rapid assessment and reconfiguration of communications infrastructure are of interest.

The Network Communications Capability Program (NCCP) will endeavor to accomplish the objectives for networking and communication through three areas of research. The first area is methods for interoperable composition of communications software stacks. Such methods will enable standard components from physical, networking, and applications layers to be dynamically composed, tested, and deployed to a wide variety of communications platforms across terrestrial, maritime, airborne, and space communications and networking applications. These components will be able to be modelled and composed using standard techniques that enable verification and validation of performance as well as resilience and affordable production through automation and machine learning.

The second area is development, augmentation, and leveraging of hardware communications platforms that allow a wide variety of networking and communications protocols. These platforms should be able to accommodate many types of missions and applications, information services for software defined networking and control plane management, and physical layer implementations with broadband high speed flexible physical layers that support wireless and optical solutions, both the DoD and commercial. Additionally, these hardware platforms should be able to accommodate measurement and assessment of the status of communication functions and mission performance.

The third area of the program enables modeling of communications systems and platforms that incorporate the ability to assess real time data from the communications system and compare it with regions of system performance with respect to latency and security of pre-determined system configurations. This area will make use of methods in model based systems engineering, as well as methods in verification and validation, and employ such techniques used in complex systems management including online models of systems performance.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Networked Communications Capability Program (NCCP)	5.692	2.975	3.168

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603662D8Z / <i>Networked Communications Capability</i>	Project (Number/Name) 663 / <i>Network Communications Analysis</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>Description: NCCP is developing its research thrusts in three areas of interoperable automated software, flexible resilient, and virtualizable hardware, and modeling that allows real time system assessment and management. The program is collaborating with programs in the DoD services that employ these methods across a wide variety of systems, from tactical to strategic. Methods that enable technology developments to be deployed as information services which are resilient to threats from the electromagnetic spectrum as well as cyber, and kinetic sources among others will be investigated.</p> <p>FY 2022 Plans: Software Development: - Demonstrate instrumented performance of existing software elements as information services. - Show interaction between hardware and software elements in the cloud environment.</p> <p>Hardware Development: - Demonstrate how hardware is flexible enough for virtualization across a variety of different communications protocols.</p> <p>Modeling: - Demonstrate prototype that allows real time modeling and comparison of system performance from measured data with resilient performance.</p> <p>FY 2023 Plans: Software Development: - Incorporate/demonstrate remaining planned and/or additional software elements as information services. - Show interaction between hardware and new software elements in the cloud environment.</p> <p>Hardware Development: - Pursue improved performance/resilience using commercial radio hardware implementations in preparation for FY 2023 Army field test.</p> <p>Modeling: - Utilize modeling results to support/target FY 2023 software and hardware improvements.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: There were no significant changes between FY 2022 and FY 2023.</p>			
Accomplishments/Planned Programs Subtotals		5.692	2.975

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603662D8Z / <i>Networked Communications Capability</i>	Project (Number/Name) 663 / <i>Network Communications Analysis</i>
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy NCCP is working with the Navy, Army, and Air Force to integrate its components into existing communications infrastructure from tactical to strategic contexts. Flexible, reconfigurable, resilient communications infrastructure is critical to addressing existing threats to DoD communications systems while reducing cost and modernizing DoD's capability.		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603680D8Z / <i>Defense Wide Manufacturing Science and Technology Program</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	1,190.629	237.098	255.244	256.142	-	256.142	248.589	153.356	143.212	145.690	-	-
680: <i>Manufacturing Science and Technology Program</i>	309.291	85.376	88.154	121.165	-	121.165	137.512	35.215	35.953	36.672	-	-
350: <i>Manufacturing Innovation Institutes</i>	881.338	151.722	163.097	129.798	-	129.798	105.887	112.951	102.069	103.725	-	-
351: <i>Manufacturing Education and Workforce Development</i>	0.000	0.000	3.993	5.179	-	5.179	5.190	5.190	5.190	5.293	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Build Sustainable and Long-Term Advantage, and Build a Resilient Join Force Defense Ecosystem.

The Defense-wide Manufacturing Science and Technology (DMS&T) program is the joint, defense-wide component of the Department of Defense (DoD) Manufacturing Technology (ManTech) Program directed in Title 10 U.S.C. Section 2521. DMS&T addresses joint, cross-cutting, and high-risk/high payoff technologies; manufacturing challenges within the DoD critical technology areas; and many of the recommendations in the Executive Order Report "Assessing and Strengthening the Manufacturing and Defense Industrial Base and Supply Chain Resiliency of the United States" September 2018.

The DMS&T program objective is to increase the speed at which innovation, inventions, and scientific discoveries are turned into equipment and capabilities through advances in manufacturing technologies and processes. The DMS&T program created and is sustaining a manufacturing innovation ecosystem via activities within three Program Element (PE) Project Codes: 680 - Manufacturing Science and Technology Program (MSTP), 350 - DoD Manufacturing Innovation Institutes (MIIs), and 351 - Manufacturing Education and Workforce Development (M-EWD).

Project Code 680, Manufacturing Science and Technology Program (MSTP):

MSTP projects focus on cross-cutting defense manufacturing advancements and stimulates early development of manufacturing processes and enterprise business practices.

Project Code 350, DoD MIIs:

This project supports nine DoD-led MIIs within the national Manufacturing USA network, in accordance with mission requirements. MII technology domain focus areas are: (1) additive manufacturing; (2) digital manufacturing, design, and manufacturing cybersecurity; (3) lightweight materials; (4) integrated photonics; (5) flexible hybrid electronics; (6) smart fibers and textiles; (7) advanced tissue biofabrication; (8) advanced robotics for manufacturing; and (9) bioindustrial manufacturing. Each MII

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022		
Appropriation/Budget Activity		R-1 Program Element (Number/Name)				
0400: Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)		PE 0603680D8Z I Defense Wide Manufacturing Science and Technology Program				
is a public/private partnership with members from industry, academia, and federal and state governments that together mature manufacturing processes, build out a supporting ecosystem, and provide manufacturing education and workforce development. The consortia match DoD funding at a one to one ratio (or greater). They include small and medium as well as large manufacturers and state-of-the-art pilot facilities.						
Project Code 351, Manufacturing Education and Workforce Development (M-EWD): M-EWD provides strategic leadership of advanced manufacturing talent development within the Defense Industrial Base (DIB) with three mission objectives: (1) invest in strategic education and workforce development capabilities, (2) expand the talent acquisition pool to promote diversity equity and inclusion (DEI), (3) modernize manufacturing EWD by driving action within DIB-critical regional economies with a focus on Career & Technical Education (CTE).						
B. Program Change Summary (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget		245.757	134.022	0.000	-	0.000
Current President's Budget		237.098	255.244	256.142	-	256.142
Total Adjustments		-8.659	121.222	256.142	-	256.142
• Congressional General Reductions		-	-			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-	-			
• Congressional Adds		-	121.645			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-8.612	-			
• Other reprogramming		-0.047	-	-	-	-
• FFRDC		-	-0.423	-	-	-
• Adjustments to Budget Year		-	-	129.724	-	129.724
• Economic Assumption		-	-	4.634	-	4.634
• Distributed Manufacturing Enabled by Modular Bioindustrial and Reusable (MEMBR) Assets		-	-	2.000	-	2.000
• DoD Casting and Forging Supply Chain		-	-	15.500	-	15.500
• Diversity, Equity, Inclusion, and Accessibility		-	-	5.484	-	5.484
• Green Tech		-	-	11.300	-	11.300
• Defense Advanced Battery Supply Chain		-	-	0.500	-	0.500
• Hypersonic Weapons Components		-	-	87.000	-	87.000
Congressional Add Details (\$ in Millions, and Includes General Reductions)				FY 2021		FY 2022
Project: 680: Manufacturing Science and Technology Program						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603680D8Z I <i>Defense Wide Manufacturing Science and Technology Program</i>	
Congressional Add Details (\$ in Millions, and Includes General Reductions)		FY 2021	FY 2022
Congressional Add: <i>High Temperature Carbon Composites Manufacturing</i>		7.000	3.000
Congressional Add: <i>Advanced Structural Manufacturing (FY20 title was "Advanced Manufacturing")</i>		7.500	-
Congressional Add: <i>Carbon Hypersonics Materials Industrial Base</i>		5.000	-
Congressional Add: <i>HPC enabled advanced manufacturing</i>		17.000	25.000
Congressional Add: <i>Hypersonics Advanced Manufacturing Technology Center</i>		25.000	-
Congressional Add: <i>Automation Engineering Technology Program</i>		-	1.981
Congressional Add: <i>Difficult to Copy Manufacturing</i>		-	7.000
Congressional Add: <i>Carbon Composites for Hypersonics</i>		-	3.000
Congressional Add: <i>Advanced Materials and Materials Manufacturing</i>		-	6.000
Congressional Add: <i>Virtual Reality-Enabled Smart Installation Experimentation</i>		-	5.000
Congressional Add: <i>Natural Gas Pipeline Pilot Study</i>		-	5.000
Congressional Add Subtotals for Project: 680		61.500	55.981
Project: 350: <i>Manufacturing Innovation Institutes</i>			
Congressional Add: <i>Program Increase</i>		26.000	9.000
Congressional Add: <i>Flexible Hybrid Electronics (FHE) (FY20 title was "Manufacturing Innovation Institutes")</i>		10.000	-
Congressional Add: <i>Advanced Manufacturing</i>		14.000	2.000
Congressional Add: <i>Cyber Initiatives</i>		3.000	-
Congressional Add: <i>Digital Manufacturing</i>		7.000	-
Congressional Add: <i>Additive Manufacturing Training Insertion</i>		2.000	-
Congressional Add: <i>Hypersonics Enabling Additive Manufacturing</i>		10.000	10.000
Congressional Add: <i>5G Manufacturing Testbed</i>		5.000	-
Congressional Add: <i>Manufacturing USA Institutes</i>		5.000	-
Congressional Add: <i>Hypersonics and Thermal Management</i>		5.000	5.000
Congressional Add: <i>Arsenal Supply Chain Security Proof of Concept</i>		3.500	-
Congressional Add: <i>Cybersecurity Manufacturing Innovation Park</i>		-	1.000
Congressional Add: <i>El Paso Makes K Support for El Paso Manufacturers</i>		-	0.964

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603680D8Z I <i>Defense Wide Manufacturing Science and Technology Program</i>	
<u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u>		FY 2021	FY 2022
Congressional Add: <i>Certification Based Workforce Training Programs for Manufacturing (Jobs of the Future)</i>		-	6.200
Congressional Add: <i>Silicon Based Lasers</i>		-	10.000
Congressional Add: <i>Domestic Textile Manufacturing</i>		-	7.500
Congressional Add: <i>Data Analytics and Visualization System</i>		-	12.000
Congressional Add: <i>Advanced Robotics and Automation Training</i>		-	2.000
Congressional Add Subtotals for Project: 350		90.500	65.664
Congressional Add Totals for all Projects		152.000	121.645
<u>Change Summary Explanation</u>			
FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.			
FY 2022 funding establishes multi-year funding for Manufacturing Education and Workforce Development initiatives under Project Code P351 and also fully funds the long-term strategic partnership with the Manufacturing Innovation Institutes across the Future Years Defense Program (FYDP).			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603680D8Z / <i>Defense Wide Manufacturing Science and Technology Program</i>				Project (Number/Name) 680 / <i>Manufacturing Science and Technology Program</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
680: <i>Manufacturing Science and Technology Program</i>	309.291	85.376	88.154	121.165	-	121.165	137.512	35.215	35.953	36.672	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Office of the Secretary Defense (OSD) Manufacturing Science and Technology Program (MSTP) concentrates on cross-cutting defense manufacturing needs that are beyond the ability of a single service to address. The MSTP invests in broad technology initiatives within Advanced Electronics and Optics, Advanced Materials and Composites, Advanced and Emerging Manufacturing Processes, and Advanced Energetics Manufacturing.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Advanced Electronics and Optics	8.879	8.750	11.341
<p>Description: Advanced Electronics and Optics is a series of efforts addressing advanced manufacturing technologies for a wide range of applications such as sensors, radars, power generation, switches, and optics for defense applications. Focal points are productivity and efficiency gains in the defense manufacturing base to accelerate delivery of technical capabilities to impact current warfighting operations, and manufacturing technologies to reduce the cost, acquisition time and risk to our major defense acquisition programs. Future efforts will focus on advances in fuel cells, lasers, enhanced acuity micro-displays, and transparent ceramics for opto-mechanical and armor applications.</p> <p>FY 2022 Plans: Fund the final year of the Low-Cost Chip Scale Atomic Clock project and Year 2 of 4 of the Improved Photovoltaic Power for Space project. Utilize the annual project call to select and initiate projects that support the National Defense Strategy and DoD critical technology areas.</p> <p>FY 2023 Plans: Fund Year 3 of 4 for Improved Photovoltaic Power for Space Applications, Year 2 of 3 for High Power Magnetron and Advanced High Yield Infrared Focal Plane Arrays, and Year 2 of 5 for TRISoC project. Initiate foundational assessment of Defense Advanced Battery Supply Chain. Utilize the annual project call to select and initiate projects that support the National Defense Strategy and DoD critical technology areas.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase includes additional Advanced Electronics and Optics project investments begun in FY 2022 and an FY 2023 increase of \$0.500 million to conduct manufacturing-specific assessments of the Defense Advanced Battery Supply Chain along with funding for DoD battery projects in PEs 0603342D8Z (Defense Innovation Unit (DIU)), 0605798D8Z (Defense Technology</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603680D8Z / Defense Wide Manufacturing Science and Technology Program	Project (Number/Name) 680 / Manufacturing Science and Technology Program		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Analysis), 0607210D8Z (Industrial Base Analysis and Sustainment Support), 0603724N (Navy Energy Program), 0603462A (Next Generation Combat Vehicle Advanced Technology), and 0901212N (Service-Wide Support (Not Otherwise Accounted For)).					
<p>Title: Advanced Materials and Composites</p> <p>Description: Advanced Materials and Composites is a series of efforts addressing advanced manufacturing technologies for a wide range of materials such as composites, metals, ceramics, nanomaterials, and metamaterials. Through productivity and efficiency gains, these manufacturing technologies will accelerate delivery of technical capabilities to impact current warfighting operations, while reducing the cost, acquisition time and risk of our major defense acquisition programs. Advanced materials manufacturing technologies undergoing development include materials for ballistic survivability and ballistic protection, survivability and rapid fabrication of structural components.</p> <p>FY 2022 Plans: Fund the MOC3HA initiative for Year 5 of 6 and the Hypersonic RF Seeker Window and Thermoplastic Composites projects will enter their final year of funding. Utilize the annual project call to select and initiate projects that support the National Defense Strategy and DoD critical technology areas.</p> <p>FY 2023 Plans: Fund final year of the Manufacturing of Carbon-Carbon Composites for Hypersonic Applications (MOC3HA) initiative, Year 2 of 5 for Self-Damping Structural Materials and Year 3 of 4 for Advanced Aeroshell Technology. Initiate non-recurring engineering (NRE) Research Development Test & Evaluation (RDT&E) in conjunction with existing propulsion Industrial Base, DoD Additive Manufacturing Working Groups, and Manufacturing Innovation Institutes to extrapolate hypersonics lessons-learned and scale to relevant hypersonic cruise missile (HCM) (e.g., Scramjet) propulsion production. Coupon production, Design of Experiments, and Integration activities will prove out design parameters and build techniques for reduced-complexity and improved performance Scramjet combustor componentry. This effort will set the stage for Year 2 scramjet RDT&E in FY 2024 to install and provide for the maintenance of large-format printers to meet capacity requirements. Utilize the annual project call to select and initiate projects that support the National Defense Strategy and DoD critical technology areas.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase for assessment and strategy development for the hypersonics industrial base in conjunction with projects in Program Elements (PE) 0605518N (Conventional Prompt Strike (Navy)), 0607210D8Z (Industrial Base Analysis and Sustainment Support), 0603680F (Manufacturing Technology Program (Air Force)), and 0902199D8Z (Title III/Defense Production Act Purchases) to reduce the cost of hypersonics weapons materials and production in ongoing development programs.</p>			6.725	12.755	99.112
Title: Advanced and Emerging Manufacturing Processes			4.594	6.550	6.481

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603680D8Z / Defense Wide Manufacturing Science and Technology Program	Project (Number/Name) 680 / Manufacturing Science and Technology Program		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>Description: Advanced and Emerging Manufacturing addresses advanced manufacturing technologies and business practices for defense applications. Key focus areas include direct digital (or additive) manufacturing, advanced manufacturing enterprise, machining, robotics, assembly, and joining. Projects selected will accelerate delivery of technical capabilities to impact current warfighting operations while reducing cost, acquisition time, and risk of major defense acquisition programs.</p> <p>FY 2022 Plans: Lightweight Hydrogen Fuel Cell project will enter the final year of funding and Deformable Mirrors for High Energy Lasers will enter funding Year 2 of 3. Utilize the annual project call to select and initiate projects that support the National Defense Strategy and DoD critical technology areas.</p> <p>FY 2023 Plans: Fund final year of Deformable Mirrors for High Energy Lasers and Year 2 of 5 for Direct-Write Manufacturing for Conformal Antennas. Utilize the annual project call to select and initiate projects that support the National Defense Strategy and DoD critical technology areas.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.</p>					
<p>Title: Advanced Energetics Manufacturing</p> <p>Description: Advanced Energetics Manufacturing develops improved manufacturing capabilities for safer, low cost, high quality production of existing and newly developed ingredients and composites used in energetic materials production. Develops techniques such as additive manufacturing, microfluidics, continuous processing, resonant acoustic mixing, robotics, etc. for production of critical energetics and supporting ingredients to ensure Department access to these materials and enable development of new, highly advanced energetic systems for improved range and performance.</p> <p>FY 2022 Plans: The Infrared Countermeasures project will be in the final year of execution in FY 2022. Utilize the annual project call to select and initiate projects that support the National Defense Strategy and DoD critical technology areas.</p> <p>FY 2023 Plans: Fund final year of DBX-1 project. Utilize the annual project call to select and initiate projects that support the National Defense Strategy and DoD critical technology areas.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.</p>			3.678	4.118	4.231
Accomplishments/Planned Programs Subtotals			23.876	32.173	121.165

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603680D8Z / Defense Wide Manufacturing Science and Technology Program	Project (Number/Name) 680 / Manufacturing Science and Technology Program
	FY 2021	FY 2022
Congressional Add: High Temperature Carbon Composites Manufacturing FY 2021 Accomplishments: Reduce the cost of preform construction and densification processes for Carbon/Carbon and Carbon/Silicon Carbide materials through process automation including densification automation, pitch crush automation, and weaving automation. Reduce the cost of inspection through digital x-ray and automated x-ray reading and advancements to computer tomography (CT) scanning capabilities as well as incorporate vision systems and automated inspection techniques. FY 2022 Plans: Execution strategy is being formulated and will align to previously funded efforts.	7.000	3.000
Congressional Add: Advanced Structural Manufacturing (FY20 title was "Advanced Manufacturing") FY 2021 Accomplishments: Continue development of advanced powder supply for cold-spray specific applications. Create a DoD-wide framework for qualification data sets to facilitate accelerated cold-spray approvals within DoD. Streamline site-installation approvals for cold spray capabilities at organic repair facilities throughout DoD.	7.500	-
Congressional Add: Carbon Hypersonics Materials Industrial Base FY 2021 Accomplishments: Reduce the cost and process variability of 3D Polar weaving through full automation of the weaving process. Hypersonic boosters and thermal protection system (TPS) systems require a polar weave due to the size and pressures. Currently this is a manual weaving process.	5.000	-
Congressional Add: HPC enabled advanced manufacturing FY 2021 Accomplishments: Cyber-harden the High-Performance Computing (HPC) on the edge devices to reduce vulnerability to attacks. Investigate non-intrusive acoustic or electromagnetic (XRAY, CT) technologies during the print process to detect voids, bubbles, etc. Finite element model analysis with respect to the physics differences involved as prints move from small scale to large scale. FY 2022 Plans: Execution strategy is being formulated and will align to previously funded efforts.	17.000	25.000
Congressional Add: Hypersonics Advanced Manufacturing Technology Center FY 2021 Accomplishments: Establish a large-scale classified manufacturing space to demonstrate scalability of manufacturing capabilities & capacity within the hypersonics ecosystem, and reduce risk for transition to production with design for manufacturing. Naval Surface Warfare Center Crane will manage a coordinated effort that leverages Purdue University facilities (e.g., wind tunnels) to engage in development activities to advance materials and manufacturing processes required to meet hypersonics needs. Requirements include flow &	25.000	-

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603680D8Z / <i>Defense Wide Manufacturing Science and Technology Program</i>	Project (Number/Name) 680 / <i>Manufacturing Science and Technology Program</i>	
		FY 2021	FY 2022
design optimization of multi-material systems, additive manufacturing of disparate material systems, joining of multi-material systems and components, and sub-assembly performance testing.			
Congressional Add: Automation Engineering Technology Program FY 2022 Plans: Execution strategy is being formulated.		-	1.981
Congressional Add: Difficult to Copy Manufacturing FY 2022 Plans: TBD - Execution Strategy is being formulated.		-	7.000
Congressional Add: Carbon Composites for Hypersonics FY 2022 Plans: TBD - Execution Strategy is being formulated.		-	3.000
Congressional Add: Advanced Materials and Materials Manufacturing FY 2022 Plans: TBD - Execution Strategy is being formulated.		-	6.000
Congressional Add: Virtual Reality-Enabled Smart Installation Experimentation FY 2022 Plans: TBD - Execution Strategy is being formulated.		-	5.000
Congressional Add: Natural Gas Pipeline Pilot Study FY 2022 Plans: TBD - Execution Strategy is being formulated.		-	5.000
Congressional Adds Subtotals		61.500	55.981
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks N/A			
D. Acquisition Strategy ManTech projects are awarded competitively through the DoD Service Laboratories. Approximately 1/3 of the total active topics are awarded to new initiatives annually.			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603680D8Z / Defense Wide Manufacturing Science and Technology Program				Project (Number/Name) 350 / Manufacturing Innovation Institutes			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
350: Manufacturing Innovation Institutes	881.338	151.722	163.097	129.798	-	129.798	105.887	112.951	102.069	103.725	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Department of Defense (DoD) supports nine Manufacturing Innovation Institutes (MIIs), public/private partnerships that address both commercial and defense manufacturing needs within specific, defense-relevant technology areas. MIIs receive active participation and support from the military departments and defense agencies and their members. The MIIs' flexible business models and strong focus on enabling highly collaborative research and development (R&D) are catalyzing important new organizational relationships across government, industry, and academia. MIIs bring together both traditional defense and non-traditional sectors to accelerate key innovation cycles, expand U.S. industrial capability, and assist in creating resilient supply chains that will support innovative defense products.

DoD's nine MIIs are: (1) America Makes (for additive manufacturing); (2) MxD (Manufacturing times Digital, for digital manufacturing, design and cybersecurity); (3) LIFT (Lightweight Innovations For Tomorrow, for innovative processes to lightweight materials); (4) AIM Photonics (American Institute for Manufacturing Integrated Photonics, for photonic device manufacturing and packaging); (5) NextFlex (for flexible hybrid electronics manufacturing); (6) AFFOA (Advanced Functional Fabrics of America, for smart fibers and textiles); (7) BioFabUSA (for regenerative tissue manufacturing); (8) ARM (Advanced Robotics Manufacturing, for smart collaborative robotics for manufacturing); and (9) BioMADE (for biomanufacturing of non-medical materials and products).

MII funding is focused on:

- Conducting pre-competitive applied research and development projects to reduce the cost, time, and technical uncertainty related to new manufacturing technologies and to improve existing technologies, processes, and products.
- Developing and implementing education, training, and workforce recruitment courses, materials, and programs.
- Developing innovative methodologies and practices for supply chain integration and introduction of new technologies into supply chains.
- Engaging with small and mid-sized manufacturers, including women and minority-owned manufacturing enterprises, and larger-sized manufacturing firms.

Each MII has a different model, with the following core tenets:

- Each MII is a public/private partnership with representatives from industry, academia, state and local governments, and the DoD that co-invest in world-leading technologies and capabilities.
- Each MII provides facilities to allow collaborative, precompetitive development of promising technologies and to promote the creation of stable and sustainable innovation ecosystems for advanced manufacturing.
- The partnership forming the MII must commit non-federal resources that equal or exceed the federal commitment.
- Each institute participates in the national Manufacturing USA network.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603680D8Z / <i>Defense Wide Manufacturing Science and Technology Program</i>		Project (Number/Name) 350 / <i>Manufacturing Innovation Institutes</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Title: America Makes (Additive Manufacturing) Description: America Makes' mission is to accelerate the adoption of additive manufacturing (AM) in the United States industrial base. Additive manufacturing (i.e., 3D printing) is a process of joining materials to make objects from 3D model data, usually layer upon layer, as opposed to subtractive manufacturing methodologies such as traditional machining. Additive manufacturing benefits the DoD by enabling lifecycle cost savings and enhanced capabilities including: distributing supply chains to enable the right part in the right place at the right time; improving mission readiness by producing work aids for DoD depots; replacing long-lead time and out of production spares, and enhancing lethality through production of lighter weight and higher performing parts than could otherwise be achieved with traditional manufacturing. FY 2022 Plans: Continue the long-term strategic partnership with America Makes to include additional project calls with America Makes members; education and workforce development activities, and support to DoD joint additive manufacturing activities. FY 2023 Plans: America Makes will continue to execute its mission by strategically advancing the development of AM design, material, process, and value chain technology, will secure human capital to deploy additive manufacturing, and will expand and support the AM ecosystem through standards development and targeted networking opportunities. Key new initiatives include a project for sustainable AM to mitigate climate change by improving engine thermal management, eliminating toxic, long-lead, and expensive materials like Beryllium in the production of optical components, or exploring novel application of AM technologies; Diversity, Equity, and Inclusion (DEI) in the AM workforce; and orientation of institute activity to increase support to Space, Power, and Energy sector stakeholder needs. Advance AM for castings by creating a castings roadmap and executing a certification-focused direct to metal AM for casting replacement project, studying effects of hybrid manufacturing adoption on casting capacity and cost, and demonstrating AM as an alternative to casting select parts. Explore AM for forging applications by creating a forgings roadmap, collecting data for AM state of practice, and maturing AM processes as an alternative to forging select parts. FY 2022 to FY 2023 Increase/Decrease Statement: A \$15.5 million increase funds castings and forgings research and a \$1.5 million increase funds climate/green technology manufacturing projects. The increase also contributes to MII Diversity, Equity and Inclusion (DEI) projects for the manufacturing workforce and increases support for industry cost-matched initiatives for new projects.			5.727	7.755	26.616
Title: MxD – Manufacturing times Digital (Digital Manufacturing, Design and Cybersecurity) Description: MxD focuses on implementation of the Digital Thread; the unencumbered flow of data across the lifecycle of a manufactured product encompassing data from design, production, supply, sourcing, inventory, assembly, quality, maintenance, and sustainment. It includes analysis of data to reduce the time and cost of bringing new products to market. MxD eliminates			6.466	8.579	10.783

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Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603680D8Z / <i>Defense Wide Manufacturing Science and Technology Program</i>	Project (Number/Name) 350 / <i>Manufacturing Innovation Institutes</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
barriers between design, manufacturing, and sustainment by using both product data and process data in a way that is seamless and transparent.				
<p>FY 2022 Plans: Continue the long-term strategic partnership with MxD by executing the recently awarded FY 2021 projects with the goal of advancing the cybersecurity of the manufacturing supply chain and driving new digital manufacturing technologies and capabilities across the U.S. manufacturing base.</p> <p>FY 2023 Plans: MxD will conduct proposal calls approximately every other month resulting in 5 new projects with a planned value of \$10 million including cost share. MxD will conduct proposal workshops for each call and award projects in the technology thrust areas identified in the 2021-2023 Strategic Investment Plan. MxD plans to announce the commercialization of new digital manufacturing and design technologies and industry capabilities. MxD will significantly scale up commercialization, skill improvement, and workforce development efforts and expand DEI via research projects and relationships with other government agencies.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The increase contributes to MII Diversity, Equity and Inclusion (DEI) projects for the manufacturing workforce, supports several new digital manufacturing and cyber initiatives, and continues investment in efforts initiated in FY 2022.</p>				
<p>Title: LIFT – Lightweight Innovations for Tomorrow (Lightweight Innovations – materials and processes)</p> <p>Description: Advanced lightweight material can retain properties comparable to heavier, traditional materials, and can enable weight reduction in a variety of components and products with significant energy savings and increased payloads. Scale-up research across multiple areas to accelerate market expansion by applying an integrated materials and manufacturing approach, will address a lack of design guides and certifications as well as affordability and scale-up challenges. The goal is to catalyze the development of an advanced lightweight material U.S. supplier base and to enable DoD to realize greater speed and agility of manned, unmanned, and Warfighter systems as well as benefits for commercial applications.</p> <p>FY 2022 Plans: Continue the long-term strategic partnership with LIFT by executing FY 2021 initiatives such as Hypersonics and Cold Spray work. Accelerate deployment of advanced manufacturing technologies such as linear friction welding; design and manufacturing methods for promising high strength alloys; optimized ultra-fast heat treatment and quenching techniques for thin-walled casting applied to components for military vehicles.</p> <p>FY 2023 Plans: LIFT will continue its focus on advanced R&D/insertion of materials and manufacturing technologies, growing capability within the structural manufacturing ecosystem, and education and workforce development. Efforts will support defense, commercial,</p>		6.696	8.883	11.139

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Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603680D8Z / <i>Defense Wide Manufacturing Science and Technology Program</i>		Project (Number/Name) 350 / <i>Manufacturing Innovation Institutes</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
and dual-use, priorities. Specific technology activities include hypersonic materials/manufacturing; lightweighting of defense and commercial systems/ components; advanced materials development; advanced fabrication and manufacturing methods such as cold spray and large-scale, wire-assisted additive manufacturing; and integrated computational materials engineering. LIFT will maintain and operate its Learning/Talent Development Lab, which includes benchtop equipment for training in key manufacturing competencies. LIFT will continue workforce development projects, expanding Diversity, Equity and Inclusion (DEI) while targeting K-12, university students, current workforce, and separating military personnel.					
FY 2022 to FY 2023 Increase/Decrease Statement: The increase contributes to MII Diversity, Equity and Inclusion (DEI) projects for the manufacturing workforce.					
Title: AIM – American Institute for Manufacturing Photonics (Integrated Photonics Device Manufacturing and Packaging) Description: Integrated photonics manufacturing advances the promise of unprecedented interconnection between electronics and photonics that will deliver world-class performance in speed, density, and power consumption. Photonics provides differentiating benefits for defense applications such as high-speed signal processing; electronic warfare; position, navigation, and timing; information transport and computation; sensing; imaging; and targeting. AIM Photonics has established an end-to-end U.S. 'ecosystem' for advancing domestic integrated photonics manufacturing, including access to a responsive integrated photonics fabrication foundry. AIM Photonics provides the world's only 300 mm silicon photonics multi-project wafer service, state-of-the-art photonics-electronics integrated design tools, and a highly advanced packaging, assembly, and testing user facility. FY 2022 Plans: Continue the long-term strategic partnership with AIM. Develop new sets of components targeted at non-standard wavelengths, which are of particular interest to the DoD. Align capabilities with other special DoD needs such as chemical/ biological sensors. Continue to support efforts aligned to OUSD(R&E) critical technology areas. Maintain a robust education and workforce development program for integrated photonics. FY 2023 Plans: AIM will continue to offer its core capabilities including silicon photonics multi-project wafer runs. These runs are enabling AIM Photonics to grow the U.S.-based integrated photonic circuit ecosystem and simultaneously offer a low risk opportunity to train new designers (which speaks to educating new talent). AIM will also continue to grow its packaging capabilities in the Rochester, NY-based test, assembly, and packaging facility and will offer services that include attaching optical fibers to their integrated photonic circuits. AIM will continue to improve integrated photonic circuit components and the process design kit that enables a diversified set of would-be users to rapidly adopt new components offering improved and/or different performance. This work will also target providing a packaging design kit to enable designers to develop prototype systems within this MII and reduce overall prototyping costs while cutting development times. AIM will expand Diversity, Equity and Inclusion (DEI) in its manufacturing workforce development efforts. An Integrated Photonic Circuits climate change mitigation project will improve silicon photonics			10.622	14.121	20.818

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603680D8Z / <i>Defense Wide Manufacturing Science and Technology Program</i>	Project (Number/Name) 350 / <i>Manufacturing Innovation Institutes</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>packaging, develop and demonstrate efficient digital transceivers for communications applications to pave the way to reduce input-output power consumption in data centers by ~30%, and develop and demonstrate highly efficient optical switches for data communications applications to reduce power consumption in data centers by as much as 50% by reducing system idle time and mitigating system architecture inefficiencies.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2022 funding reflects anticipated 'steady- state' funding that meets threshold requirements of this technology ecosystem as part of a new follow-on Cooperative Agreement. An FY 2023 increase of \$3.5 million supports climate/green technology manufacturing projects and additional funding contributes to MII Diversity, Equity and Inclusion (DEI) projects for the manufacturing workforce.</p>			
<p>Title: NextFlex Manufacturing Innovation Institute (Flexible Hybrid Electronics Manufacturing)</p> <p>Description: Flexible hybrid electronics manufacturing involves highly tailorable devices on non-traditional, compliant substrates that combine thinned components manufactured from traditional processes with components added via "printing" processes. NextFlex invests in prototyping and scale-up of manufacturing processes for high speed pick-and-place, printed circuits, and hybrid fabrication to enable defense and commercial applications in wearable electronics, unattended sensors, integrated array antennas, medical devices, and soft robotics devices. NextFlex is also committed to continuous improvement in SWAPC (Size, Weight And Power plus Cost) for electronic systems.</p> <p>FY 2022 Plans: Continue the long-term strategic partnership with NextFlex by continuing to mature flexible, stretchable hybrid electronics including advanced packaging and additive manufacturing technologies within their world-class pilot manufacturing line. Several R&D projects initiated in FY 2021 will continue execution in FY 2022.</p> <p>FY 2023 Plans: NextFlex will continue expanding the US hybrid electronics manufacturing industrial base executing 14 ecosystem-funded projects with an increased focus on reliability and yield enhanced manufacturing. NextFlex will update its manufacturing and technical roadmaps based on reliability performance of manufacturing processes leading to commercial standards. The program will deliver DoD-relevant prototypes such as large area electronics on UAVs, wearable sensor for organic industrial base, and integrated manufacturing robotic sensors for sustainment manufacturing. The workforce development programs will expand Diversity, Equity and Inclusion (DEI) as they continue their six regional FlexFactor education programs and expand Flex Pro, the professional training program, to involve 300 engineers. NextFlex is pursuing environmentally sustainable FHE device development and a project to develop a cold chain monitor as a demonstrator focused on climate change and environmental sustainability. The technology could support environmentally-friendly production and monitoring of shipping packages.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>		5.911	7.855
			11.705

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603680D8Z / <i>Defense Wide Manufacturing Science and Technology Program</i>	Project (Number/Name) 350 / <i>Manufacturing Innovation Institutes</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
An increase of \$1.8 million funds climate/green technology manufacturing projects and additional funding contributes to MII Diversity, Equity and Inclusion (DEI) projects for the manufacturing workforce.			
Title: Advanced Functional Fabrics of America (Smart Fibers and Textiles) (AFFOA) Description: AFFOA accelerates transformation of the manufacture of traditional fibers, yarns, and textiles into highly sophisticated, integrated, and networked devices and systems. It is helping to convert the domestic textile industry into one differentiated by Intellectual Property (IP) and value-added technology. AFFOA mission outcomes will lead to highly functional fabrics that provide valuable services: fabrics that see, hear, sense, communicate, store and convert energy, regulate temperature, monitor health, and change color. AFFOA is translating these outcomes into new and improved textiles that benefit the warfighter as well as the commercial consumer. FY 2022 Plans: Enter into a new follow-on 5-7 years Assistance Instrument to continue the long-term strategic partnership with AFFOA. This agreement will involve a reduced but still significant strategic investment of federal funds in recognition of the 'steady-state' of AFFOA's maturity and the value it provides to the DoD. DoD critical technology area 'Quick Start' projects are likely to be part of the FY 2022 award. FY 2023 Plans: AFFOA will advance R&D efforts focused on integrating member and/or DoD technologies into functional prototypes for dual use DoD and commercial applications, with project calls focused on manufacturing and commercialization. AFFOA will expand it innovation and manufacturing ecosystem to enable small companies, DoD labs, and Defense Industrial Base partners increased access to AFFOA's organic fabric prototyping and advanced textile system integration capabilities. It will cultivate membership supply chains to support the DoD capability needs and critical technology areas. Education and Workforce Development (EWD) efforts will expand Diversity, Equity and Inclusion (DEI) and include developing strategic workforce development training, internships, and other activities with domestic universities and regional vocational training centers. To mitigate climate change, AFFOA will explore and select clothing and textile fibers (organic and synthetic) that meet military uniform performance criteria and can be disposed of or recycled without negative ecological impacts such as clogging waterways, contaminating soil, or polluting the air. FY 2022 to FY 2023 Increase/Decrease Statement: FY 2022 funding provides limited funding for a new agreement to continue DoD strategic engagement in the public/private partnership with AFFOA. An increase of \$1.0 million funds climate/green technology manufacturing projects and additional funding contributes to MII Diversity, Equity and Inclusion (DEI) projects for the manufacturing workforce.		6.000	6.155
Title: BioFabUSA Manufacturing Innovation Institute (regenerative tissue manufacturing)		0.000	10.992

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603680D8Z / Defense Wide Manufacturing Science and Technology Program	Project (Number/Name) 350 / Manufacturing Innovation Institutes		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>Description: BioFabUSA advances state-of-the-art human tissue manufacturing innovations in cell and biomaterial processing, bioprinting, automation, and non-destructive testing technologies. BioFabUSA is establishing a collaboration to mature tissue-related technology across manufacturing readiness levels (MRL) 4-7, enabling post-delivery assurance of tissue identity, viability, function, and efficacy. This MII is assembling a diverse and currently fragmented collection of industry practices and institutional knowledge across many disciplines (e.g., cell biology, bioengineering, materials science, analytical chemistry, robotics, and quality assurance).</p> <p>FY 2022 Plans: BioFabUSA will be in year six of a seven-year stand-up phase. BioFabUSA will continue to improve the tissue foundry prototype line. As BioFabUSA develops supported tools and enabling technologies through institute projects, they will begin to replace off-the-shelf tools used to establish the initial prototype line with the newly developed technologies.</p> <p>FY 2023 Plans: BioFabUSA will focus on expanding manufacturing process development of institute member-derived tissue engineered medical products. BioFabUSA will integrate additional sensor and automation technologies into current versions of the manufacturing platform. BioFabUSA will fund technology projects, therapeutic development projects, and education and workforce development (EWD) projects that expand DEI in the biomanufacturing workforce.. BioFabUSA will roll out pilot-phase EWD certification and credentialing programs regionally and nationally.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Completes internal funding re-phasing to address execution issues and fulfills the government-committed funding profile for the initial standup phase agreement for this institute. Additional funding contributes to MII Diversity, Equity and Inclusion (DEI) projects for the manufacturing workforce.</p>					
<p>Title: Advanced Robotics Manufacturing (Smart Collaborative Robotics for Manufacturing)</p> <p>Description: Improve U.S. manufacturing competitiveness through advancements in the smart collaborative robotics field. Technologies developed via Advanced Robotics Manufacturing (ARM) support advanced robotics capabilities to address DoD requirements and improve U.S. manufacturer competitiveness with robotics. ARM is focusing on technologies enabling human robot interaction, and perfecting robotic adaption, learning, manipulation, autonomy, mobility, and perception.</p> <p>FY 2022 Plans: ARM will be in year six of a seven-year stand-up phase. Develop (1) methods and tools for adoption, integration, and readiness to include virtual modeling and simulation and testing; (2) user-friendly interfaces, natural language communication, and human-robot trust/safety; (3) Plug-and-play hardware and software, utilizing open source and open architectures; (4) Modular designs,</p>			5.800	10.785	5.259

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603680D8Z / <i>Defense Wide Manufacturing Science and Technology Program</i>		Project (Number/Name) 350 / <i>Manufacturing Innovation Institutes</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
smart flexible end-effectors and sensors, automated path planning/mobility; and (5) collaborative, self-aware, machine learning/artificial intelligence techniques, and advanced computing.					
FY 2023 Plans: ARM will continue technical project-level investments to advanced industrial robotic technologies for the development of novel automated manufacturing capabilities. Specific technical areas will include intelligent robotics, human-robot interaction, autonomous operation, dexterous manipulation, and rapid system development/configurability. Other investments will produce education and workforce initiatives to develop robotic competencies, credentialing, apprenticeships, and a nationwide training identification toolset while seeking to expand Diversity, Equity and Inclusion (DEI) in the robotics manufacturing workforce. Target transitions are for OUSD(R&E) S&T priorities, Service-level Organic Industrial Base, and the related Defense Industrial Base.					
FY 2022 to FY 2023 Increase/Decrease Statement: FY 2022 is the final year of the DoD initial multi-year contract commitment to the ARM MII. In the follow-on phase beginning in FY 2023, the DoD strategic investment is reduced to a lower level for a more narrow focus on Department objectives while ARM leverages other investments from industry and other partners brought in during the establishment phase.					
Title: BioMADE Manufacturing Innovation Institute			14.000	17.000	23.609
Description: The BioMADE MII promises to deliver a new class of manufacturing with domestic capabilities to manufacture critical resources with increased supply chain security. Bioindustrial manufacturing also has the potential to create entirely new classes of products with primary defense applications, such as chemicals and materials with advanced properties for use in austere environments. Bioindustrial manufacturing addresses defense priorities and offers commercial potential for innovations in food, agriculture, fuel, pharmaceuticals, and other consumer products that will create new opportunities for U.S. manufacturers.					
FY 2022 Plans: BioMADE will be in year two of a seven-year stand-up phase. Mature the emerging manufacturing innovation ecosystem for bioindustrial technologies. Establish pilot lines for downstream processing. Conduct road-mapping activities to inform and initiate the first project calls. Make subrecipient awards for each cost-shared project.					
FY 2023 Plans: BioMADE intends to spur biomanufacturing innovation by investing in technical project calls to reduce barriers to scale-up and commercialization of bio-manufactured products, accelerate technology deployment, investigate novel downstream processing techniques, and de-risk the process of bringing new products to market. BioMADE will accelerate the DoD biotechnology critical technology areas by promoting biotechnology innovation and securing the domestic bioindustrial base. BioMADE will initiate planning and technology development for distributed manufacturing enabled by modular bioindustrial and reusable (MEMBR) assets. Education and workforce development project calls will build awareness of bioindustrial manufacturing careers and address workforce gaps through innovative educational strategies that increase DEI to expand the workforce. Ethical, Legal, and					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603680D8Z I Defense Wide Manufacturing Science and Technology Program	Project (Number/Name) 350 I Manufacturing Innovation Institutes		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Social Implications (ELSI) programs will guide bioethics, biosecurity, biosafety, and other ELSI topics. BioMADE will continue the Domestic Production of Latex Rubber project, a 5-year effort initially funded in FY21, to address supply chain security concerns with latex rubber production. Latex rubber is required for DoD and domestic aircraft tires; synthetic rubbers cannot meet the demanding performance requirements. BioMADE seeks to establish a domestic source for latex rubber by determining if dandelion rubber can be scaled to produce sufficient latex rubber to meet DoD requirements. BioMADE will conduct an open project call to positively impact climate change through de-risking innovative green bioindustrial techniques and harnessing fermentation as an environmentally friendly method for producing chemicals of interest and whole cell biomass for food security. FY 2022 to FY 2023 Increase/Decrease Statement: Increase establishes the second full increment of the government’s funding profile to invest in the standup phase of this institute. Includes a \$3.5 million increase for climate/green technology manufacturing projects. Additional funding contributes to MII Diversity, Equity and Inclusion (DEI) projects for the manufacturing workforce. Also includes \$2.0 million for a university design challenge for the Modular Manufacturing Center which supports the Manufacturing Enabled by Modular Bioindustrial and Reusable (MEMBR) assets initiative funded in PEs 0603680D8Z (Defense Wide Manufacturing Science and Technology Program), 0605797D8Z (Maintaining Technology Advantage), 0902199D8Z (Title III/Defense Production Act Purchases), and 00602128D8Z (Promotion and Protection Strategies).					
Accomplishments/Planned Programs Subtotals			61.222	97.433	129.798
			FY 2021	FY 2022	
Congressional Add: Program Increase FY 2021 Accomplishments: Initiate projects supporting manufacturing requirements for DoD critical technology areas including 5G, microelectronics, hypersonics, directed energy, and fully networked command, control, and communications (FNC3). Enable additive manufacturing decision-making and life cycle data management. Increase the DoD strategic investment in the MIIs to improve their ability to advance research and technology, expand associated manufacturing ecosystems, and secure human capital through technology-related education and workforce development activities. FY 2022 Plans: Execution strategy is being formulated and will align to previously funded efforts.			26.000	9.000	
Congressional Add: Flexible Hybrid Electronics (FHE) (FY20 title was "Manufacturing Innovation Institutes") FY 2021 Accomplishments: Conduct open calls for FHE manufacturing projects relevant to commercial and DoD critical technology areas. Address FHE manufacturing, reliability, and scale-up for Connected Soldier Devices (C3), Human Monitoring, Harsh Environments (Hypersonics and Munitions), Autonomy and Communications for Unmanned Aerial Vehicles (UAVs). Improve NextFlex hub tools and capabilities to			10.000	-	

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603680D8Z / <i>Defense Wide Manufacturing Science and Technology Program</i>	Project (Number/Name) 350 / <i>Manufacturing Innovation Institutes</i>	
		FY 2021	FY 2022
support prototyping of increasingly sophisticated FHE systems. Expand collaboration to address manufacturing development and supply chain bottlenecks. Create workforce education digital technical training course/modules.			
Congressional Add: Advanced Manufacturing FY 2021 Accomplishments: Extend University of Texas at El Paso (UTEP) Driving Research, Innovation, and Value through the (Driving Research, Innovation, and Value through Education in Additive Manufacturing) DRIVE AM program to produce a superior additive manufacturing educated military, domestic manufacturing workforce, and defense supply chain. Provide a K-PhD science, technology, engineering, and mathematics (STEM) education pipeline and business creation ecosystem using a holistic approach for developing proficiency in AM while growing local and national economies. FY 2022 Plans: Execution strategy is being formulated and will align to previously funded efforts.		14.000	2.000
Congressional Add: Cyber Initiatives FY 2021 Accomplishments: Issue a competitive call for cyber manufacturing research to develop self-adapting, resilient Operational Technology (OT) threat analysis technologies to recognize, in real-time, new threat vectors and craft novel security responses. Mature OT cyber resilience analytics leveraging high-performance data analytics resources while maintaining functional and security assurances. Perform reverse engineering of network protocols and controllers to expand the adaptability of OT threat analysis technologies.		3.000	-
Congressional Add: Digital Manufacturing FY 2021 Accomplishments: Support the DoD Digital Engineering Strategy and use of digital representations of systems and components and digital artifacts to design and sustain national defense systems.		7.000	-
Congressional Add: Additive Manufacturing Training Insertion FY 2021 Accomplishments: Continue the University of Texas at El Paso (UTEP) – America Makes Driving Research, Innovation, and Value through Education in Additive Manufacturing (“DRIVE AM”) program to develop and deliver additive manufacturing training to service members. Training includes virtual interactive, hands on implementation of 3D printers for high impact training opportunities at the Foundational, Specialty, and Authority levels.		2.000	-
Congressional Add: Hypersonics Enabling Additive Manufacturing FY 2021 Accomplishments: Conduct research on candidate geometries/ applications and materials for development of air breathing hypersonic systems. Enable additive manufacturing (AM) development efforts anchored by Ursa Major, a part of the hypersonics industrial base, which is establishing a manufacturing		10.000	10.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603680D8Z / <i>Defense Wide Manufacturing Science and Technology Program</i>	Project (Number/Name) 350 / <i>Manufacturing Innovation Institutes</i>	
		FY 2021	FY 2022
presence at the America Makes Youngstown campus. Focus on AM for rocket motors / propulsion components, with lines of effort in active cooling and high temperature sensor integration; modified AM machines capable of larger build volumes to reduce/eliminate joining; and collaboration with University of Texas at El Paso (UTEP) heat flux modeling and sensor integration. Efforts will expand training opportunities in connection with DRIVE AM. Articles to be prototyped with outside vendors with testing in partnership with NASA Glenn. FY 2022 Plans: Execution strategy is being formulated and will align to previously funded efforts.			
Congressional Add: 5G Manufacturing Testbed FY 2021 Accomplishments: Expand existing MxD Manufacturing Innovation Institute dual-use testbed with additional 5G infrastructure using an open call for RD&D manufacturing use project(s) relevant to commercial and DoD critical technology areas, including Real-Time 5G Logistics with In-Transit Visibility and Manufacturing Cognitive Readiness Training and Skills Capture. Conduct programming/training to educate manufacturers, industry, and government and demonstrate 5G Future Factory Connectivity.		5.000	-
Congressional Add: Manufacturing USA Institutes FY 2021 Accomplishments: Increase the DoD strategic investment in the MIIIs to improve their ability to advance research and technology, expand associated manufacturing ecosystems, and secure human capital through technology-related education and workforce development activities.		5.000	-
Congressional Add: Hypersonics and Thermal Management FY 2021 Accomplishments: Build on results of the LIFT Manufacturing Innovation Institute FY 2020 Hypersonics Challenge investment to increase development of hypersonic powders for manufacturing to meet DoD requirements for cross-platform system development. Coordinate requirements with the Hypersonics Working Group. FY 2022 Plans: Execution strategy is being formulated and will align to previously funded efforts.		5.000	5.000
Congressional Add: Arsenal Supply Chain Security Proof of Concept FY 2021 Accomplishments: Engage Army arsenals (e.g., Rock Island) to establish supply chain security pilot(s) to improve DoD Organic Industrial base supply chain resiliency. The MxD Manufacturing Innovation Institute will conduct outreach activities (e.g., workshops, roadshows, assessments) to determine priorities for pilots, then issue an open call for projects to establish pilots to address the priorities identified.		3.500	-
Congressional Add: Cybersecurity Manufacturing Innovation Park		-	1.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603680D8Z / <i>Defense Wide Manufacturing Science and Technology Program</i>	Project (Number/Name) 350 / <i>Manufacturing Innovation Institutes</i>
	FY 2021	FY 2022
FY 2022 Plans: TBD - Execution strategy is being formulated.		
Congressional Add: El Paso Makes K Support for El Paso Manufacturers	-	0.964
FY 2022 Plans: TBD - Execution strategy is being formulated to complement previously funded related efforts.		
Congressional Add: Certification Based Workforce Training Programs for Manufacturing (Jobs of the Future)	-	6.200
FY 2022 Plans: TBD - Execution strategy is being formulated.		
Congressional Add: Silicon Based Lasers	-	10.000
FY 2022 Plans: TBD - Execution strategy is being formulated to complement previously funded related efforts (FY 2020).		
Congressional Add: Domestic Textile Manufacturing	-	7.500
FY 2022 Plans: TBD - Execution strategy is being formulated.		
Congressional Add: Data Analytics and Visualization System	-	12.000
FY 2022 Plans: TBD - Execution strategy is being formulated.		
Congressional Add: Advanced Robotics and Automation Training	-	2.000
FY 2022 Plans: TBD - Execution strategy is being formulated.		
Congressional Adds Subtotals	90.500	65.664
C. Other Program Funding Summary (\$ in Millions)		
N/A		
Remarks		
D. Acquisition Strategy		
Each Manufacturing USA institute is established through a competitive selection process. The executing military department or agency, in close and continuous coordination with OSD ManTech, publishes a formal solicitation (funding opportunity announcement) for proposals describing the scope of required activities and extensive proposal evaluation criteria. Non-Profit Organizations (including universities) are eligible to bid, and each bidder forms a broad consortium of industry and academic partners. The executing military department or agency, in close coordination with OSD, uses a team of government experts to evaluate each proposal against the evaluation criteria and selects a winning consortium. The final terms of the cooperative agreement/technology investment agreement between the selectee and the federal government are then negotiated and the CA or TIA is signed. Throughout and after completion of this process, the federal government makes clear that members of non-selected teams are encouraged to join the selected consortium as conditions permit.		

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603680D8Z / Defense Wide Manufacturing Science and Technology Program				Project (Number/Name) 351 / Manufacturing Education and Workforce Development			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
351: Manufacturing Education and Workforce Development	0.000	0.000	3.993	5.179	-	5.179	5.190	5.190	5.190	5.293	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The Office of the Secretary Defense (OSD) promotes equity and inclusion in manufacturing careers, drives regional action to modernize manufacturing Career & Technical Education (CTE) for the U.S. industrial base, invests in strategic education and workforce development capabilities, and expands strategic leadership of advanced manufacturing human capital development.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: Manufacturing Education and Workforce Development									-	3.993	5.179	
Description: The Manufacturing Education and Workforce Development (M-EWD) program builds on activities from FY 2019-2021 resourced by Project Code 350 and congressional interest items including the Manufacturing Engineering Program. Key M-EWD accomplishments include development of a strategic framework for DoD leadership of advanced manufacturing talent development, eight MII-led regional initiatives informed by labor market data profiles of regional economies, start of a pilot effort to develop an automated real-time labor market data portal, and launch of ManufacturingWorkforce.org, a dual-use digital learning platform with advanced manufacturing course offerings.												
FY 2022 Plans: The primary M-EWD effort will be a pilot project to expand the pool of talent and promote equity and inclusion in manufacturing careers by building upon Minority-Serving Institution (MSI) and Historically Black Colleges and Universities (HBCU) partnerships developed beginning in FY 2021. The secondary effort is a pilot project to build regional economic and talent development alliances. The initial alliance project will address skill shortages and gaps in the shipbuilding industry in southeast Virginia.												
FY 2023 Plans: The M-EWD program will sponsor a project to expand the pool of talent and promote equity and inclusion in manufacturing careers by building upon Minority-Serving Institution (MSI) and Historically Black Colleges and Universities (HBCU) partnerships developed beginning in FY 2021. A second key effort will be a pilot project to build regional economic and talent development alliances. The program will also continue to sustain and enhance the Open edX digital learning platform for industry and DoD personnel, as well as the labor market data portal projects.												
FY 2022 to FY 2023 Increase/Decrease Statement:												

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603680D8Z / <i>Defense Wide Manufacturing Science and Technology Program</i>	Project (Number/Name) 351 / <i>Manufacturing Education and Workforce Development</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
New Project Code 351 established with \$4.000 million in FY 2022 and additional out-year funding to promote a diverse and inclusive manufacturing workforce. The increase will allow for expansion of manufacturing-related education and workforce programs.			
Accomplishments/Planned Programs Subtotals		-	3.993
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)					PE 0603716D8Z I Strategic Environmental Research and Development Program (SERDP)							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	563.741	79.661	91.571	58.411	-	58.411	60.047	61.618	60.536	61.746	-	-
470: Strategic Environmental Research and Development Program (SERDP)	563.741	79.661	91.571	58.411	-	58.411	60.047	61.618	60.536	61.746	-	-

Note

New Start (Y/N) No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Defend the Homeland, Build Sustainable and Long-Term Advantage, and Taking Care of People.

The Strategic Environmental Research and Development Program's (SERDP) mission is to improve DoD readiness and environmental performance by providing new scientific knowledge and developing cost-effective technologies. The SERDP does this by addressing high-priority DoD environmental technology requirements such as addressing polyfluoroalkyl substance (PFAS) contamination, developing fluorine-free fire suppression formulations, and improving corrosion resistance for weapons systems and platforms. Technologies developed by SERDP enhance military operations, improve military systems' effectiveness, enhance military training/readiness, sustain DoD's training and test ranges and installation infrastructure, and help ensure the safety and welfare of military personnel and their dependents. The keys to the growing list of SERDP technological successes are the ability to respond aggressively and proactively to priority defense environmental needs; the pursuit of world-class technical excellence; and an emphasis on continuous technology transfer.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	85.429	51.863	0.000	-	0.000
Current President's Budget	79.661	91.571	58.411	-	58.411
Total Adjustments	-5.768	39.708	58.411	-	58.411
• Congressional General Reductions	-	-0.292			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	40.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-3.750	-			
• SBIR/STTR Transfer	-2.018	-			
• Budget Adjustments	-	-	58.411	-	58.411

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)		R-1 Program Element (Number/Name) PE 0603716D8Z / Strategic Environmental Research and Development Program (SERDP)
<u>Change Summary Explanation</u> FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.		

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603716D8Z / Strategic Environmenta / Research and Development Program (SE RDP)				Project (Number/Name) 470 / Strategic Environmental Research and Development Program (SERDP)			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
470: Strategic Environmental Research and Development Program (SERDP)	563.741	79.661	91.571	58.411	-	58.411	60.047	61.618	60.536	61.746	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The SERDP's mission is to improve DoD mission readiness and environmental performance by providing new scientific knowledge and developing cost-effective technologies. SERDP does this by addressing high-priority DoD environmental technology requirements such as addressing polyfluoroalkyl substance (PFAS) contamination, developing fluorine-free fire suppression formulations, and improving corrosion resistance for weapons systems and platforms. Technologies developed by SERDP enhance military operations, improve military systems' effectiveness, enhance military training/readiness, sustain DoD's training and test ranges and installation infrastructure, and help ensure the safety and welfare of military personnel and their dependents. The keys to growing list of SERDP technological successes are the ability to respond aggressively and proactively to priority defense environmental needs; the pursuit of world-class technical excellence; and an emphasis on continuous technology transfer.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Environmental Restoration (ER)	35.552	40.940	16.256
Description: Investments in Environmental Restoration (ER) reduce the DoD's environmental cleanup liability (currently greater than \$30B) by developing technologies for the cost-effective detection, characterization, containment, and remediation of contamination in soil, sediments, and water.			
FY 2022 Plans: Emphasis in this Program Area will continue to be heavily focused on PFAS contamination. Efforts addressing potential remediation technologies will continue as projects devoted to understanding destruction technologies, both thermal and non-thermal, will increase. Projects examining the ecological impacts of a variety of PFAS compounds will be initiated. Increased focus on PFAS remediation and disposal in accordance with Congressional direction.			
FY 2023 Plans: Development of PFAS destruction technologies, both thermal and non-thermal, will continue. Studies of the ecological impacts of PFAS mixtures initiated in FY 2022 will continue. Increased emphasis on technologies for in situ destruction of PFAS and AFFF residue that avoid the expense of pump and treat methods.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603716D8Z / Strategic Environmental / Research and Development Program (SE RDP)	Project (Number/Name) 470 / Strategic Environmental Research and Development Program (SERDP)		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Continue emphasis on issues related to PFAS contamination at DoD installations. The increase is the result of planned program growth in support for technologies for PFAS remediation.				
<p>Title: Munitions Response (MR)</p> <p>Description: Munitions Response (MR) develops detection, classification, and remediation technologies for Unexploded Ordnance (UXO) to address the significant DoD liability in the Military Munitions Response Program. Investments are also made to improve active range clearance and to reduce generation of UXO during live fire testing and training operations.</p> <p>FY 2022 Plans: Efforts in FY 2022 will begin to focus on multi-sensor platforms for underwater UXO detection and identification as well as algorithms to fuze multiple data sets collected from different platforms. Initial tests at standardized test sites will be conducted.</p> <p>FY 2023 Plans: Continued testing of both acoustic and electromagnetic sensor systems developed over the past three years at standard test sites. These tests will guide continued development of the systems tested as well as point the way to technology gaps to be addressed in coming years.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The increase is the result of planned program growth to support the development of methods and algorithms to efficiently reduce the output of low-frequency sonar systems to actionable information for site managers.</p>		5.521	6.480	5.510
<p>Title: Resource Conservation and Resiliency (RC)</p> <p>Description: Resource Conservation and Resiliency (RC) develops the science and technologies required to sustain training and testing ranges. This includes management strategies and tools to enable installation staff to carry out their duties more effectively and development of data and models to enable base planners to increase resilience of their facilities.</p> <p>FY 2022 Plans: Work will continue on technologies and methods to address wildland fire on DoD installations. Efforts on understanding the impacts of invasive species on strategic mobility will mature as will models for installation infrastructure resilience in response to multiple stressors. New projects will be initiated to understand the impacts of saltwater intrusion on installation infrastructure.</p> <p>FY 2023 Plans: New projects will be initiated to develop models to aid installation planning staff cope with the rapidly changing threats associated with climate variability. Continued emphasis on the impacts of saltwater intrusion on installation infrastructure.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>		14.629	20.894	22.593

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603716D8Z / <i>Strategic Environmental Research and Development Program (SE RDP)</i>	Project (Number/Name) 470 / <i>Strategic Environmental Research and Development Program (SERDP)</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
The increase is for climate adaptation enhancements that will be used for additional projects focusing on climate sustainability of installation infrastructure.			
Title: Weapons Systems and Platforms (WP) Description: Weapons Systems and Platforms (WP) develops technologies and materials that reduce the waste and emissions associated with the manufacturing, maintenance, and use of DoD weapons systems and platforms to reduce future environmental liabilities and their associated costs and impacts. FY 2022 Plans: Projects on alternative delivery methods for fire-fighting formulations will mature. Focus on new corrosion resistant coatings as the regulatory and ESOH environment makes current solutions unavailable or dramatically more expensive. Continued work on sustainable energetics with higher performance than existing formulations through the use of advanced computational techniques. Projects to characterize the decomposition products from thermal degradation of polymeric PFAS in munitions will be initiated. FY 2023 Plans: Continued efforts on understanding the interactions of fuel molecules with a foam blanket with the goal of developing firefighting foams with improved performance against gasoline fires and in the presence of saltwater. Expanded effort on the development of chromium-free treatments and processes for use in DoD depots and repair facilities. Predictive corrosion models will mature and be ready for transition to demonstration/validation. Increased emphasis on AFFF replacement and disposal in accordance with Congressional direction. FY 2022 to FY 2023 Increase/Decrease Statement: The increase is the result of planned program growth.		23.959	23.257
Accomplishments/Planned Programs Subtotals		79.661	91.571
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)	PE 0603727D8Z I Joint Warfighting Program (JWP)											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	53.406	3.727	2.157	2.411	-	2.411	2.486	2.555	2.606	2.658	-	-
727: Joint Warfighting	53.406	3.727	2.157	2.411	-	2.411	2.486	2.555	2.606	2.658	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression, Defend the Homeland, and Build Sustainable and Long-Term Advantage.

The Joint Warfighting Program (JWP) supports the Assistant Secretary of Defense for Acquisition (ASD(A))'s responsibilities for acquisition and portfolio management. The JWP underwrites analyses, studies, performs limited scope experiments, wargaming, and partnerships that define joint capability gaps and develops credible requirements for follow-on acquisition efforts. These analyses and assessments deliver independent perspectives on potential remedies to align acquisition investments and solutions for joint capability gaps created by future warfighting environments and emerging threats. The JWP supports mission engineering integration management, as well as other high priority emerging issues requiring independent analysis to inform acquisition decisions that impact National Security.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	3.869	2.169	0.000	0.000	0.000
Current President's Budget	3.727	2.157	2.411	0.000	2.411
Total Adjustments	-0.142	-0.012	2.411	-	2.411
• Congressional General Reductions	-	-0.012			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.142	-			
• Adjustments to Budget Year	-	-	2.411	-	2.411

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget Request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603727D8Z / Joint Warfighting Program (JWP)				Project (Number/Name) 727 / Joint Warfighting			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
727: Joint Warfighting	53.406	3.727	2.157	2.411	-	2.411	2.486	2.555	2.606	2.658	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Joint Warfighting Program (JWP) supports the Assistant Secretary of Defense for Acquisition (ASD(A))'s responsibilities for acquisition and portfolio management. The JWP underwrites analyses, studies, performs limited scope experiments, wargaming, and partnerships that define joint capability gaps and develops credible requirements for follow-on acquisition efforts. These analyses and assessments deliver independent perspectives on potential remedies to align acquisition investments and solutions for joint capability gaps created by future warfighting environments and emerging threats. The JWP supports mission engineering integration management, as well as other high priority emerging issues requiring independent analysis to inform acquisition decisions that impact National Security.

Anticipated Impact:

Provides analytical support for acquisition efforts for ASD(A) staff elements and joint customers. It promotes analyses and assessments for acquisition insights and decisions focused on capability development serving the needs of joint forces and the warfighter.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Acquisition Analysis for Joint Capability Requirements	3.727	2.157	2.411
Description: Small Satellite Coordinating Activity (FY 2021 Accomplishments):			
-SSCA Phase 3 developed an integrated SmallSat and related technology roadmap and strategy for implementation and maintenance.			
-Revised and matured the SmallSat Roadmap such that it can begin to directly inform OUSD(A&S) priorities for Future Years Defense Program 2022-2026.			
Mission Engineering Data Modeling in Strategic Portfolio Reviews (FY 2021 Accomplishments):			
-Provided Mission Engineering Data Modeling and Characterization to support OSD Cost Assessment and Program Evaluation (CAPE) and Joint Staff Strike Strategic Portfolio Review (SPR).			
-Identified minimum set of critical data types and developed a pilot case for authoritative data modeling that is repeatable and scalable for mission capability portfolio management.			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603727D8Z / <i>Joint Warfighting Program (JWP)</i>	Project (Number/Name) 727 / <i>Joint Warfighting</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>-Integrated user models to support machine learning and provide automation in the MUSE User Interface.</p> <p>-Delivered initial automated task extraction methodology and started coding in MUSE to facilitate automatic population of warfighter task information (e.g. Uniform Joint Task Lists) into the MUSE database.</p> <p>Mission Engineering (ME) Capabilities Development (FY 2021 Accomplishments):</p> <p>-Developed technical ME analytical framework (the effects/kill-chain framework) and application tool (MUSE). Integrated analytical tools to identify and exploit opportunities for interoperability with potential allied partners.</p> <p>Mission Engineering-Automate Effects/Kill Chain & Architecture Products into M&S tools (FY 2021 Accomplishments):</p> <p>-Developed an automated methodology to execute Mission Engineering and Integration to transition from static architectures to executable dynamic models for time-dependent assessments of complex operations.</p> <p>-Developed prototype plan for methodology and tools to develop and assess Mission Effects Chain (MEC) using a model-based systems engineering approach combined with automation technologies.</p> <p>Anticipated Impact: Provides analytical support for acquisition efforts for ASD(A) staff elements and joint customers. It promotes analyses and assessments for acquisition insights and decisions focused on capability development serving the needs of joint forces and the warfighter.</p> <p>FY 2022 Plans: Mission Engineering and Integration Mission Thread Pathfinder Analysis: Develop and pilot a Digital Engineering environment a re-usable Digital Engineering environment and methodology for these mission threads to help automate, simplify, and integrate Mission Engineering.</p> <p>Follow-on USSF C2 Review: Assess the status of execution phase activities and challenges in costing an agile software program, flexibility and extensibility of the technical architecture, software development control processes, and sufficiency of mechanisms used to map requirements and monitor execution progress to product roadmaps.</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603727D8Z / Joint Warfighting Program (JWP)	Project (Number/Name) 727 / Joint Warfighting	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>RIZER Assessment: Identify any cybersecurity vulnerabilities or gaps in the operational effectiveness of using RAZER software on the latest versions of Da-Jiang Innovation systems.</p> <p>FY 2023 Plans: Continued acquisition analysis through a portfolio management lens to address the critical joint warfighting mission areas critical to national defense. Major focus areas will support the following projects:</p> <ul style="list-style-type: none"> - Continued Mission Engineering and Integration Mission Thread Pathfinder Analysis: Develop and pilot a Digital Engineering environment a re-usable Digital Engineering environment and methodology for these mission threads to help automate, simplify, and integrate Mission Engineering. -Continued Follow-on USSF C2 Review: Assess the status of execution phase activities and challenges in costing an agile software program, flexibility and extensibility of the technical architecture, software development control processes, and sufficiency of mechanisms used to map requirements and monitor execution progress to product roadmaps. -Continued RIZER Assessment: Identify any cybersecurity vulnerabilities or gaps in the operational effectiveness of using RAZER software on the latest versions of Da-Jiang Innovation systems. <p>FY 2022 to FY 2023 Increase/Decrease Statement: ASD(A) adjusted funding and focus to address mission priority areas and realigned funding for enduring requirements for independent analyses in support of agile software development and software provenance mission areas. In FY 2020 and beyond, this segment was combined with Acquisition Analytic Development of Joint Military Requirements.</p>			
Accomplishments/Planned Programs Subtotals		3.727	2.157
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)					PE 0603769D8Z / Advanced Distributed Learning							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	56.842	6.588	6.056	0.201	-	0.201	0.213	0.223	0.227	0.232	-	-
776: Advance Distributed Learning (ADL)	56.842	6.588	6.056	0.201	-	0.201	0.213	0.223	0.227	0.232	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

New Start (Y/N): No

Based on a Memorandum of Agreement between OUSD(P&R) and DHRA, the Advanced Distributed Learning (ADL) program is transferred to DHRA for oversight responsibilities from P&R to DHRA. This agreement transfers funds encompassing Operation and Maintenance (O&M), Defense-Wide and Research, Development, Test and Evaluation (RDT&E) appropriations. No civilian or military authorization will transfer with this action. Remaining funding pays for one contractor to fulfil ADL's requirements and residual actions and may also be transferred in future budgets. The reduction of \$342,000 was as a result of the Congressional reduction to general FFRDC funding.

A. Mission Description and Budget Item Justification

This program supports the Department's initiative Taking Care of People.

Advanced Distributed Learning (ADL) program is helping DoD evolve its distributed learning systems (e.g., online courses, smartphone-based learning, and DoD-wide enterprise systems for training and education). These improvements benefit DoD in several ways: (1) EFFICIENCY: Increase business systems' efficiency, saving time and resources, by eliminating duplications and developing shared services for digital learning technology and data. (2) EFFECTIVENESS: Improve the quality and efficiency of training/education delivery via online systems by developing modern technologies, integrated data systems, and associated learning science, ultimately impacting personnel readiness.

This program was originally established in response to Section 378 of Public Law 105-261, the National Defense Authorization Act for FY 1999. Other authorities were later provided through, for example, the Defense Planning Guidance. The ADL program directly supports all DoD Components, and as a leader in the field of distributed learning technologies, also coordinates with other Federal agencies, Allies, and Partners. This leads to the program's third benefit: (3) INTEROPERABILITY: It strengthens interagency, interorganizational, and multinational interoperability by developing shared distributed learning capabilities and policy and through leadership in DoD, Federal, and Coalition communities of practice.

The program's work falls into three interrelated categories: (A) Modernization, (B) Documentation, and (C) Coordination. The "modernization" work involves Advanced Technology Development (RDT&E subfield Advanced Technology Development 6.3) in technical areas such as e-learning, mobile learning, IT/data interoperability, learner data modeling and analytics, and associated learning science. These efforts inform the program's "documentation" work, including the authoring and upkeep of technical guidance and policy documents, such as DoD Instruction 1322.26 ("Distributed Learning") and software/data interoperability specifications. Finally,

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022		
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)		R-1 Program Element (Number/Name) PE 0603769D8Z I Advanced Distributed Learning				
the documentation work drives “coordination” efforts, which consist of implementation support and interagency, interorganizational, and international (e.g., NATO) coordination.						
This program's modernization investments are vetted through the Defense ADL Advisory Committee, a working group of military personnel and DoD/Federal civilians who formally represent their organizations' distributed learning interests. These requirements are also aligned to DoD/Federal strategic direction, such as the DoD Digital Modernization Strategy, DoD and Federal Data Strategies, and Personnel and Readiness Strategy for 2030. They are also considered against emerging industry trends and technologies.						
B. Program Change Summary (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget		6.765	6.398	0.000	-	0.000
Current President's Budget		6.588	6.056	0.201	-	0.201
Total Adjustments		-0.177	-0.342	0.201	-	0.201
• Congressional General Reductions		-	-0.342			
• Congressional Directed Reductions		-0.001	-			
• Congressional Rescissions		-	-			
• Congressional Adds		-	-			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-0.176	-			
• Adjustments to Budget Year		-	-	0.201	-	0.201
Change Summary Explanation						
FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.						
Based on a Memorandum of Agreement between OUSD(P&R) and DHRA, the Advanced Distributed Learning (ADL) program is transferred to DHRA for oversight responsibilities from P&R to DHRA. This agreement transfers funds encompassing Operation and Maintenance (O&M), Defense-Wide and Research, Development, Test and Evaluation (RDT&E) appropriations. No civilian or military authorization will transfer with this action. Remaining funding pays for one contractor to fulfil ADL's requirements and residual actions.						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2021	FY 2022	FY 2023
Title: Advance Distributed Learning (ADL)				6.588	6.056	0.201
Description: Advance Distributed Learning (ADL) program serves as the innovation hub for distributed learning across DoD and other government agencies. The ADL program supports DoD-wide initiatives for innovation, modernization, and advancement of						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603769D8Z I <i>Advanced Distributed Learning</i>		
C. Accomplishments/Planned Programs (\$ in Millions) online and mobile electronic training capabilities as well as associated enterprise-wide software/data services. Activities include advanced technology design and development, demonstrations, assessments, and associated policy stewardship. Results improve efficiencies and reduce costs, in part, by reducing time spent in face-to-face instruction, allowing more time for practical application and repetition, increasing interoperability (which enables discovery, retrieval, and reuse of distributed learning content), and researching and prototyping methods of distributed learning with superior motivational and learning outcomes. FY 2022 Plans: 1. Enterprise Course Catalog -- Finalize transition of the Enterprise Course Catalog by completing remaining developmental test and evaluation efforts. Complete any remaining steps to obtain cybersecurity accreditation for operation of the system. Implement the associated standard for Learning Metadata, and coordinate with the CDO Council to potentially expand relevant shared services from this effort into other DoD systems (e.g., for linked data). 2. Enterprise Learner Record Repository -- Build the Learner Profile data standard. Conduct developmental testing of the prototype, demonstrating safe data integration of learner records across multiple DoD organizations. 3. Learning Services Ecosystem -- Total Learning Architecture (TLA) Enterprise Architecture, i.e., the software/data backbone across digital training and education technologies. Work on the developmental environment will continue with Defense Components to support implementation of the TLA with their systems (i.e., modernizing legacy technology). Produce DevSecOps documentation to help these organizations transition the TLA. This work is the "data backbone" for Enterprise Digital Learning Modernization. 4. Update Distributed Learning Policy -- Continue to coordinate with the Defense ADL Advisory Committee to incorporate new requirements into existing Defense policy, as required. Additional work is anticipated to integrate updated guidance on data standards and the enterprise architecture. New guidance on Identity, Credential, and Access Management as well as data privacy, data handling, and single sign-on will also be considered in support of the Enterprise Course Catalog and Enterprise Learner Record Repository. 5. Coordination -- Continue to coordinate with Defense Allies and Partners on distributed learning, to include the NATO Training Group, Partnership for Peace Consortium, and The Technical Cooperation Program. Work with DoD groups (e.g., Defense ADL Advisory Committee, CDO Council, Joint Enterprise Standards Committee) and professional technical organizations to enact and govern software/data standards and digital learning science. FY 2023 Plans:		FY 2021	FY 2022	FY 2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>		R-1 Program Element (Number/Name) PE 0603769D8Z I <i>Advanced Distributed Learning</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Based on a Memorandum of Agreement between OUSD(P&R) and DHRA, the Advanced Distributed Learning (ADL) program is transferred to DHRA for oversight responsibilities from P&R to DHRA. This agreement transfers funds encompassing Operation and Maintenance (O&M), Defense-Wide and Research, Development, Test and Evaluation (RDT&E) appropriations. No civilian or military authorization will transfer with this action. Remaining funding pays for one contractor to fulfil ADL's requirements and residual actions.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> Based on a Memorandum of Agreement between OUSD(P&R) and DHRA, the Advanced Distributed Learning (ADL) program is transferred to DHRA for oversight responsibilities from P&R to DHRA. This agreement transfers funds encompassing Operation and Maintenance (O&M), Defense-Wide and Research, Development, Test and Evaluation (RDT&E) appropriations. No civilian or military authorization will transfer with this action. Remaining funding pays for one contractor to fulfil ADL's requirements and residual actions.</p>				
Accomplishments/Planned Programs Subtotals		6.588	6.056	0.201
D. Other Program Funding Summary (\$ in Millions) N/A				
Remarks				
E. Acquisition Strategy N/A				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>					R-1 Program Element (Number/Name) PE 0603781D8Z I <i>Software Engineering Institute (SEI)</i>							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	12.128	14.631	13.417	-	13.417	16.993	17.427	17.829	18.186	Continuing	Continuing
781: <i>Software Engineering Institute (SEI)</i>	-	12.128	14.631	13.417	-	13.417	16.993	17.427	17.829	18.186	Continuing	Continuing

Note

New Start (Y/N): No

This Software Engineering Institute (SEI) Advanced Technology Development Program Element (PE) applies the software and computer science concepts developed under the 0602751D8Z PE to research, develop, and rapidly transition state-of-the-art software technology, tools, development environments, and best practices to improve the engineering, management, fielding, evolution, acquisition, and sustainment of software-intensive Department of Defense (DoD) systems.

A. Mission Description and Budget Item Justification

This program supports the Departments initiatives to Build a Sustainable and Long-Term Advantage, and Build a Resilient Joint Force and Defense Ecosystem.

Software is more pervasive than ever, and computer programs are growing in size and complexity. Designing, managing, and securing integrated, complex, and large-scale mission-critical systems are abilities that the Department of Defense (DoD) and the Defense Industrial Base (DIB) have not yet mastered. Reliance on software-intensive mobile and net-based products and systems has increased (e.g., Joint Tactical Radio System, USS ZUMWALT (DDG-1000), Joint Strike Fighter, F-22, and Army Modernization). As stated in the February 2018 Defense Science Board Report, "Design and Acquisition of Software for Defense Systems," software is a crucial and growing part of weapons systems and the national security mission, and the DoD must address its ability to build and sustain software continuously and indefinitely. With growing global parity in software engineering, the DoD must maintain leadership to ensure a competitive advantage.

The Software Engineering Institute (SEI) Federally Funded Research and Development Center (FFRDC) was established in 1984 as an integral part of the DoD's initiative to identify, evaluate, and transition software engineering technologies and practices. The mission of the SEI is to provide the DoD with technical leadership and innovation through research and development to advance the practice of software engineering and technology. The SEI works across government, industry, and academia to improve the state of software engineering from the technical, acquisition, and management perspectives. The SEI engages in research and development of critical software technologies and tools and collaborates with the larger software engineering research community. It facilitates rapid transition of software engineering technologies into practice and evaluates emerging software engineering technologies to determine their potential for improving software-intensive DoD systems. Since its inception, the SEI has helped to transform the fields of software engineering and acquisition, network security, real-time systems, software architectures, and software-engineering process management.

The SEI Program Element (PE) addresses the critical need to research, develop, and rapidly transition state-of-the-art software technology, tools, development environments, and best practices to improve the engineering, management, fielding, evolution, acquisition, and sustainment of software-intensive DoD systems. The

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603781D8Z I <i>Software Engineering Institute (SEI)</i>
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research conducted by this PE directly benefits the technical domains, such as Command, Control, Communications, Computers, and Intelligence (C4I), Autonomy and Artificial Intelligence (AI), Cyber, and Engineered Resilient Systems.

B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	12.590	14.677	0.000	-	0.000
Current President's Budget	12.128	14.631	13.417	-	13.417
Total Adjustments	-0.462	-0.046	13.417	-	13.417
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.460	-			
• Other Reprogramming	-0.002	-	-	-	-
• FFRDC	-	-0.046	-	-	-
• Adjustments to Budget Year	-	-	12.954	-	12.954
• Economic Assumption	-	-	0.463	-	0.463

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603781D8Z / Software Engineering Ins titute (SEI)				Project (Number/Name) 781 / Software Engineering Institute (SEI)			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
781: Software Engineering Institute (SEI)	-	12.128	14.631	13.417	-	13.417	16.993	17.427	17.829	18.186	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project focuses on two main research thrusts with known military applications: (1) Software Engineering, Systems Verification and Validation, and Mission Assurance (formerly Mission Assurance); and (2) Information Assurance.

SEI research focuses on the most significant and pervasive software challenges within the DoD, such as the scalability and reliability of software assurance, supply chain risk management, validation of and trust in autonomous systems, human-computer and human-technology teaming and interaction, computing and communication at the tactical edge, and efficiency and performance of acquisition strategies and software development appropriate for a contested cyber environment.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: SEI Advanced Technology Development in the Area of Software Engineering, Systems Verification and Validation, and Mission Assurance	10.356	10.844	9.620
<p>Description: This research seeks to mature and rapidly prototype techniques to verify methods for identifying requirements, systems of systems architectures, and virtual integration of components. Furthermore, research in this area will pursue rapid prototyping and transitioning of capabilities that verify requirements for software assurance, analysis/control of unverified code and automated repair of damaged code. Software production and code analysis methods developed through this program will also improve the ability to predict how complex software systems, including AI-enabled systems, will behave in untested environments. Increasingly, large numbers of lines of code and the addition of machine-learning techniques will require a commensurate increase in sophisticated verification and validation mechanisms.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> • Incorporate uncertainty modeling and methods to improve machine-learning models used by DoD/IC organizations to increase their ability to reason about machine learning model inferences and to reduce the time to retrain to achieve an acceptable level of accuracy and/or certainty. • Verify and extend model checking for design properties of for DoD systems and software, demonstrating a reduction in the mean time required to detect design defects from months to hours. • Prototype an AI risk analysis approach that enables developers to elicit requirements and conduct an independent verification of the security properties of the machine learning components through unit, integration, and uncertainty tests. <p>FY 2023 Plans:</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603781D8Z / Software Engineering Ins titute (SEI)	Project (Number/Name) 781 / Software Engineering Institute (SEI)		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none">Develop new techniques to allow feedback between deployed software, software modeled through model-based systems engineering, and deployed systems. This approach can be automated using machine learning methods that enable comparison of online information systems performance with modeled systems performance in a variety of mission and application contexts. The intent of this approach in the applied areas is to implement as an information service for DoD platforms to utilize. <p>FY 2022 to FY 2023 Increase/Decrease Statement: Changes reflect minor budget fluctuations.</p>				
<p>Title: SEI Advanced Technology Development in the Area of Information Assurance</p> <p>Description: Powerful machine learning algorithms can be subverted by malicious manipulation or falsification of data collected through normal channels. Algorithms must be trusted and effective in the presence of adversaries. This thrust seeks to defend against and minimize the impacts of information falsification attacks.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none">Implement new capabilities in model software and system engineering to a) map models to micro-service performance b) use of an external micro-service analysis tool to simulate the propagation of faults and the system reconfiguration.Utilize artificial intelligence (AI) test harness to verify security properties of neural network components through unit, integration, and uncertainty tests. <p>FY 2023 Plans:</p> <ul style="list-style-type: none">Enable verification and validation of systems at the embedded level through graph based models of embedded systems performance and integration of large collections of such embedded systems on complex command and control applications. The intent of this approach in the applied areas is to implement as an information service for DoD platforms to utilize. <p>FY 2022 to FY 2023 Increase/Decrease Statement: There was no significant change between FY 2022 and FY 2023.</p>		1.772	1.787	1.797
<p>Title: Artificial Intelligence Engineering Initiatives</p> <p>Description: Artificial Intelligence (AI) engineering is an emergent discipline focused on developing tools, systems, and processes to enable the application of AI in real-world contexts. The rise in availability of computing power and massive datasets have led to the creation of new AI, models, and algorithms encompassing thousands of variables and capable of making rapid and impactful decisions. Too often, though, these capabilities work only in controlled environments and are difficult to replicate, verify, and validate in the real world. The need for an engineering discipline to guide the development and deployment of AI capabilities is urgent. AI engineering aims to provide a framework and tools to proactively design AI systems to function in environments characterized by high degrees of complexity, ambiguity, and dynamism; and aims to equip practitioners to develop systems</p>		-	2.000	2.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense								Date: April 2022			
Appropriation/Budget Activity 0400 / 3				R-1 Program Element (Number/Name) PE 0603781D8Z / <i>Software Engineering Ins</i> <i>tute (SEI)</i>			Project (Number/Name) 781 / <i>Software Engineering Institute (SEI)</i>				
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2021	FY 2022	FY 2023	
across the enterprise-to-edge spectrum, to anticipate requirements in changing operational environments and conditions, and to ensure human needs are translated into understandable, ethical, and thus trustworthy AI. <i>FY 2022 Plans:</i> • Develop an AI Engineering Book of Knowledge, creating a Department standard specifying a guide to the generally accepted AI engineering approach. <i>FY 2023 Plans:</i> • Enable the ability for a wide variety of researchers from DoD Research Laboratories to Federally Funded Research and Development Centers to access methods in distributed cloud and High Performance Computing Environments that enable risk analysis in machine learning and distributed computing infrastructure. <i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> There was no significant change between FY 2022 and FY 2023.											
Accomplishments/Planned Programs Subtotals								12.128	14.631	13.417	
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• BA 2, RDT&E, PE # 0602751D8Z: <i>Software Engineering</i> <i>Institute Applied Research</i>	9.216	9.571	11.030	-	11.030	11.365	11.607	11.867	12.105	-	-
Remarks											
D. Acquisition Strategy											
N/A											

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)					PE 0603924D8Z I High Energy Laser Advanced Development							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	109.113	83.159	111.149	0.000	111.149	113.765	115.518	117.947	120.306	Continuing	Continuing
924: High Energy Laser Initiative	-	109.113	83.159	111.149	0.000	111.149	113.765	115.518	117.947	120.306	Continuing	Continuing

Note

New Start (Y/N): No

Beginning in FY 2022 this Program will focus on Advanced Technology Development for Directed Energy (DE) technologies divided into the following areas: (1) DE Sources; (2) Beam Control & Propagation; (3) Lethality & Vulnerability; and (4) Power & Thermal Management to reflect the Department of Defense Science and Technology (S&T) strategy and Office of the Secretary of Defense (OSD) Science and Technology (S&T) priorities for DE.

A. Mission Description and Budget Item Justification

This program supports the Departments initiatives to Build a Sustainable and Long-Term Advantage, and Build a Resilient Joint Force and Defense Ecosystem.

This program element funds Directed Energy (DE) advanced technology development aimed at translating technology solutions for broadly defined military problems into demonstrated performance pay-offs, increased capabilities, increased supportability, and/or increased affordability. DE weapons systems have many potential advantages, including speed-of-light time-to-target, high precision, low incremental cost per kill, and a magazine that is recharged through on-board, fuel-based power and thermal management systems that reduce logistics requirements in contrast to stocks of munitions or warheads. As a result, DE systems have the potential to perform a wide variety of military missions. Activities conducted under this program element will develop and demonstrate the technology necessary to enable DE system missions across the Department of Defense (DoD).

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	112.842	107.397	0.000	0.000	0.000
Current President's Budget	109.113	83.159	111.149	0.000	111.149
Total Adjustments	-3.729	-24.238	111.149	0.000	111.149
• Congressional General Reductions	-	-23.900			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.707	-			
• Other Reprogramming	-0.022	-	-	-	-
• FFRDC	-	-0.338	-	-	-

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense					Date: April 2022		
Appropriation/Budget Activity			R-1 Program Element (Number/Name)				
0400: Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)			PE 0603924D8Z I High Energy Laser Advanced Development				
• Adjustments to Budget Year			-	-	107.315	-	107.315
• Economic Assumption			-	-	3.834	-	3.834
Congressional Add Details (\$ in Millions, and Includes General Reductions)							
Project: 924: High Energy Laser Initiative							
Congressional Add: Power and Thermal Systems							
Congressional Add Subtotals for Project: 924							
Congressional Add Totals for all Projects							
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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603924D8Z / High Energy Laser Advanced Development				Project (Number/Name) 924 / High Energy Laser Initiative			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
924: High Energy Laser Initiative	-	109.113	83.159	111.149	0.000	111.149	113.765	115.518	117.947	120.306	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY 2022 this Program will focus on Directed Energy (DE) technologies divided into the following areas: (1) DE Sources; (2) Beam Control & Propagation; (3) Lethality & Vulnerability; and (4) Power & Thermal Management to reflect the Department of Defense Science and Technology (S&T) strategy and Office of the Secretary of Defense (OSD) Science and Technology (S&T) priorities for DE.

A. Mission Description and Budget Item Justification

This program element is part of an overall Department strategy in Directed Energy (DE) weapon system advanced technology development. This effort will focus on scaling the output power of DE systems to reach operationally effective power levels applicable to broad mission areas across the DoD. Additionally, efforts will also pursue improvements in common DE system components such as beam control & propagation, lethality & vulnerability, and efficient power and thermal management approaches. This program element complements, and will be closely coordinated with other DoD DE efforts directed at specific Service and Agency missions. This program leverages and/or builds upon other investments in DE by the Services and Agencies.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Directed Energy Sources	88.483	66.159	93.532
Description: Develop, mature and demonstrate directed energy sources that will provide system level performance commensurate with fieldable directed energy devices.			
FY 2022 Plans: Ongoing 300 kW-class high energy laser (HEL) sources will be completed and tested. The HEL sources will be transitioned and integrated into Service HEL system testbeds and demonstrators. The additional 300 kW-class HEL source, started in FY 2021, will be de-scoped to a lower-power demonstration. Planning for 500 kW-class laser source development will begin as open architectures and components are matured to support scaling from 300 to 500 kW.			
FY 2023 Plans: Scaling HEL sources from 300 to 500 kW will begin utilizing two laser builders who best demonstrate scaling to 300 kW.			
FY 2022 to FY 2023 Increase/Decrease Statement: Increase is due to minor budget fluctuations.			
Title: Beam Control and Propagation	1.715	3.385	3.480

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603924D8Z / <i>High Energy Laser Advanced Development</i>	Project (Number/Name) 924 / <i>High Energy Laser Initiative</i>		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>Description: Develop, mature and demonstrate technologies that support improving beam control and beam propagation for DE weapon systems.</p> <p>FY 2022 Plans: Continue to collect data on thermal blooming effects of high-power lasers, including the effects of aerosols. Continue to model beam propagation for Service HEL tactical engagements. Collect data on thermal blooming effects at higher laser powers to validate HEL propagation models. Advance technologies for atmospheric compensation and thermal blooming mitigation. Evaluate beam control efforts across the Department and develop an investment strategy for cross-cutting technology development in beam control systems.</p> <p>FY 2023 Plans: Collect data on thermal blooming effects at higher laser powers to validate HEL propagation models. Collect tracking and atmospheric compensation data leveraging beam control testbed efforts across the Department to assess maturity of components developed under applied research. Continue to mature cross-cutting technology development in beam control systems.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase is due to minor budget fluctuations.</p>					
<p>Title: Lethality and Vulnerability</p> <p>Description: Conduct directed energy lethality & vulnerability experiments on materials, components, and targets. Develop a lethality database, and integrate into a systems-level architecture plan and lethality models.</p> <p>FY 2022 Plans: Collect lethality damage effects on common threats across the services for high energy lasers and high power microwaves. These results, along with additional data from the services, include modeling and simulation analysis that will be used by the services to generate key vulnerability modules (VMs) for use in DE weapons effectiveness, mission and campaign level utility studies. The establishment of a unified lethality database that began in FY 2020 and will be completed in early FY 2022. As new lethality and vulnerability data are collected by the Services, the information will be integrated into the unified lethality database. Investigate the military utility of pulsed lasers. - Power & Thermal: Complete efforts begun in FY 2021 and evaluate technologies for further advanced development investments.</p> <p>FY 2023 Plans: Collect lethality damage effects and vulnerability data on common cruise missile (CM) threats of all classes for both high energy laser and high power microwave technologies. Continuous wave and pulsed laser technologies will be investigated. Testing and</p>			11.415	13.615	14.137

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603924D8Z / <i>High Energy Laser Advanced Development</i>	Project (Number/Name) 924 / <i>High Energy Laser Initiative</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
modeling and simulation (M&S) results will be used to develop vulnerability modules (VMs) for use in DE weapons' effectiveness tools, mission and campaign level utility studies. A chartered, lethality database will begin transition to the Joint Technical Coordinating Group for Munitions Effectiveness (JTTCG/ME) for analyst's use. Development efforts will continue to include HPM lethality inputs for a more complete DE lethality database product.			
FY 2022 to FY 2023 Increase/Decrease Statement: Increase is due to minor budget fluctuations.			
Accomplishments/Planned Programs Subtotals		101.613	83.159
		FY 2021	FY 2022
Congressional Add: Power and Thermal Systems		7.500	-
FY 2021 Accomplishments: Investigated power & thermal management technologies for 300-500 kW laser systems under the High Energy Laser sources scaling efforts. Developed and built a modular, transportable refrigerant direct-to-diode cooling system. Evaluated Nickel-based batteries and high-voltage-input pump-diodes for high energy laser systems.			
Congressional Adds Subtotals		7.500	-
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
N/A			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	929.510	171.891	464.850	315.090	-	315.090	304.538	273.127	216.984	219.162	-	-
091: <i>High Speed Systems Test</i>	317.128	93.001	191.463	111.362	-	111.362	112.682	106.624	79.395	80.983	-	-
092: <i>Spectrum Efficient Technology</i>	78.296	4.700	39.376	9.975	-	9.975	10.053	10.192	9.586	9.777	-	-
093: <i>Electronic Warfare Test</i>	114.592	13.200	121.171	119.265	-	119.265	105.055	71.619	40.073	40.874	-	-
094: <i>Advanced Instrumentation Systems Technology</i>	87.301	15.420	11.209	12.180	-	12.180	12.462	12.710	12.977	13.237	-	-
095: <i>Directed Energy Test</i>	82.937	7.800	21.568	11.322	-	11.322	11.475	11.705	11.950	12.188	-	-
096: <i>C4I & Software Intensive Systems Test</i>	129.746	14.610	12.128	13.088	-	13.088	13.246	13.511	13.794	14.070	-	-
097: <i>Autonomy and Artificial Intelligence Test</i>	66.149	8.450	11.087	22.742	-	22.742	24.028	30.858	32.752	31.248	-	-
098: <i>Cyberspace Test</i>	53.361	14.710	13.348	14.431	-	14.431	14.707	15.000	15.315	15.620	-	-
099: <i>Space Test</i>	0.000	0.000	43.500	0.725	-	0.725	0.830	0.908	1.142	1.165	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to defend the homeland, deter strategic attacks and aggression, prevail in conflict, build enduring advantage, and build a resilient joint force and defense eco system. The Test and Evaluation/Science and Technology (T&E/S&T) program seeks out and develops test technologies to keep pace with evolving weapons technologies. Aligned with the National Defense Strategy, this program is critical to ensure that the Department of Defense (DoD) has the ability to adequately test the advanced systems that will be fielded in the future, building a more lethal force. To meet this objective, the T&E/S&T Program performs the following activities:

- Exploits new technologies and processes to meet important test and evaluation (T&E) requirements.
- Expedites the transition of new technologies from the laboratory environment to the T&E community.
- Leverages industry advances in equipment, modeling and simulation, and networking to support T&E.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>
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Additionally, the T&E/S&T Program examines emerging T&E requirements resulting from Joint Service initiatives to identify T&E technology needs and develop a long-range roadmap for technology insertion. The program leverages and employs applicable applied research efforts from the highly developed technology base in theDoD laboratories and test centers, other Government agencies, and industry to accelerate development of new test capabilities. The program outreaches and engages academia to address test technology challenges in DoD testing, advancing Science, Technology, Engineering and Mathematics (STEM) initiatives at Historically Black Colleges and Universities (HBCU) and other minority serving institutions. This program provides travel funds for T&E/S&T program oversight, special studies, analyses, and strategic planning related to test capabilities and infrastructure. The T&E/S&T Program aligns with the science and technology (S&T) Communities of Interest (COI) to prepare the T&E community to test warfighting capabilities that emerge from priority S&T investments. The T&E/S&T Program utilizes Advanced Technology Development funding because which supports the development and demonstration of high payoff technologies for current and future DoD test capabilities.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	171.891	267.161	0.000	-	0.000
Current President's Budget	171.891	464.850	315.090	-	315.090
Total Adjustments	0.000	197.689	315.090	-	315.090
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustment	-	-	10.496	-	10.496
• Joint Artificial Intelligence Test and Evaluation Infrastructure Capability	-	-	10.685	-	10.685
• Congressional Adjustment	-	198.000	-	-	-
• FFRDC Adjustment	-	-0.311	-	-	-
• Budget Year Adjustment	-	-	293.909	-	293.909

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

FY 2022 Congressional addition of \$198.000M improves the following capabilities: 1) upgrade space ground testing facilities by developing new test technologies enabling space systems to be more reliably and accurately tested on the ground prior to launch; 2) upgrade space test lab and range infrastructure to validate space domain awareness enhancements, as well as capabilities to support dedicated tracking and imaging of systems as part of the development of a National Space Test and Training Complex; 3) advance large energy national shock tunnels to assess aerothermal and dynamic event effects on hypersonic, ballistic missile defense, and strategic systems and advanced sensors; 4) upgrade electromagnetic spectrum lab and test range infrastructure to prototype 5G test environments needed to assess commercial 5G operation impacts on critical test data transmission in operationally relevant test environments; 5) upgrade

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)	R-1 Program Element (Number/Name) PE 0603941D8Z / Test and Evaluation Science and Technology	
directed energy lab and test range infrastructure to develop required instrumentation on the missile and sUAS target to assess High Power Microwave (HPM) effects; 6) upgrade target lab and test range infrastructure to continue the development and fielding of next-generation aerial target platforms; 7) improve capacity for hypersonics flight test to augment hypersonic launch capabilities and continue the prototype development of rapid, responsive flight test capabilities; FY 2022 decrease of \$10M reflects a congressionally directed reduction of funds due to excessive growth.		

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>				Project (Number/Name) 091 / <i>High Speed Systems Test</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
091: <i>High Speed Systems Test</i>	317.128	93.001	191.463	111.362	-	111.362	112.682	106.624	79.395	80.983	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

High-speed/hypersonic weapons are being developed to ensure the continued military superiority and strike capability of the United States including freedom of movement and freedom of action in areas protected by anti-access/area denial defenses. Current weapon system demonstrations and technology development programs include high-speed and hypersonic air-breathing missiles, maneuvering reentry and boost-glide weapons, hypersonic gun-launched projectiles, and air-breathing space access vehicles. These systems require development of conventional and high-speed turbine, ramjet, scramjet, and combined cycle engines; high temperature materials; thermal protection systems (TPS); and thermal management systems. The High Speed Systems Test (HSST) project addresses test technology needs including propulsion, aerodynamic and aerothermal testing, so the test community has the technology to support the required test scenarios for concepts under development in the S&T community. The technology developments within the HSST project align with the Department of Defense (DoD) S&T priority investments. As such, the HSST project is developing, validating and transitioning advanced T&E technologies for ground test, open-air range flight test, and advanced computational tools, along with instrumentation and diagnostics systems for use in both ground tests and flight tests of high speed systems.

The HSST project develops technologies to enable robust, accurate, and timely T&E of these future weapon systems. DoD acquisition regulations require weapon systems to undergo a thorough T&E process to detect deficiencies early and to ensure system suitability and survivability. However, the extreme environments in which these weapons operate preclude accurate determination of their performance and operability with today's T&E assets. Current national test capabilities have deficiencies in data accuracy, flight condition replication and simulation, test methods, productivity, modeling and simulation (M&S) fidelity, and range safety.

The HSST mission is to address these national test capability gaps by providing test technology solutions that will enable high-speed and hypersonic weapon systems to be successfully developed through accurate, robust, and efficient T&E.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: High Speed Systems Test	93.001	191.463	111.362
Description: The HSST project continued to advance ground and flight test technologies, techniques, instrumentation, and modeling and simulation capabilities required for the development of hypersonic weapon systems. In F 20Y21, HSST continued to address critical technology shortfalls for hypersonic test and evaluation in aerothermal and propulsion ground testing capabilities and advanced instrumentation to support hypersonic flight tests. Several other technology development efforts also progressed through the year.			
To address the technology shortfall involving aerothermal and propulsion testing, HSST is developing a new test facility that utilizes clean-air heat addition (non-vitiated air) and a variable Mach number (VMN) capability to provide the representative high-			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>	Project (Number/Name) 091 / <i>High Speed Systems Test</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>temperature conditions for characterizing weapon systems, including air-breathing propulsion capabilities. The clean-air heat addition is especially important to the characterization of air-breathing propulsion systems, as previous HSST efforts demonstrated that vitiated air provides different gas properties than clean air found in the atmosphere and thus is not representative of what the vehicle would experience in flight. This significantly affects the engine's performance and operability in the test environment and results in erroneous flight predictions. Additionally, characterization of advanced sensors for hypersonic systems also benefits from clean-air heat addition as it provides a more representative environment for the sensor to operate in. The variable Mach number capability provides a more representative trajectory simulation for the system under test, permitting more accurate predictions before conducting flight tests.</p> <p>The new test facility, called the Hypersonic Aerothermal and Propulsion Clean-Air Testbed (HAPCAT), was checked out at the upper envelope and the facility was configured to demonstrate test techniques that determine the combined aerodynamic and aerothermal effects on advanced hypersonic sensors performance. All of the efforts associated with HAPCAT also serve as pathfinders for the development of a larger-scale, more capable facility at the AEDC.</p> <p>Upgrades and development efforts associated with aerothermal testing also continued in FY 2021. HSST continued multiple efficiency upgrades to the AEDC arc heaters to increase throughput in response to significant test demand. HSST also initiated new aerothermal test technology development efforts to prototype alternative high enthalpy test technologies, to include a plasmatron test capability.</p> <p>Significant progress was achieved in the development of the SkyRange capability, an unmanned aerial vehicle-based range to support hypersonic flight tests and other missions for the Department of Defense. SkyRange provides a more agile, flexible, and cost-effective method for providing support to hypersonic flight tests with increased data collection capabilities beyond the current state-of-the-art. It also addresses a critical throughput shortfall for supporting the number of hypersonic flight tests required, as a sufficient number of existing assets does not exist. RQ-4 Global Hawks and MQ-9 Reapers comprise the platforms used for SkyRange. SkyRange augments existing air, sea, and land test support assets referred to as the "string of pearls," reducing the high costs associated with traditional flight test support. Novel sensors are being developed in the areas of telemetry capture and relay, multispectral imaging, atmospheric sensing, terminal scoring, and other areas to aid in the development of hypersonic systems. Several of these sensors are being developed through HSST for integration into the SkyRange capability.</p> <p>Achievements were made for both SkyRange aircraft platforms in FY 2021. Work continued on the modification of three RQ-4s to facilitate sensor package integration as part of SkyRange. Upon completion, this will result in three operational RQ-4s for SkyRange. For the MQ-9s, six aircraft were acquired and stationed at the main operating base in California. These MQ-9s will be used for integrating various sensors, generally through the use of pylon-carried pods.</p>			
			FY 2023

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>		Project (Number/Name) 091 / <i>High Speed Systems Test</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>The development, integration, and operation of a phased-array telemetry capability continued as part of SkyRange. The telemetry antenna underwent flight testing and subsequent improvements to subsystem operability and reliability. RQ-4s will be available to collect flight test mission telemetry data in early FY 2023, proving telemetry antenna initial operational capability.</p> <p>RangeLynx module installation is underway on two RQ-4 aircraft to provide real-time satellite-based telemetry relay to ground stations.</p> <p>Progress continued on the development of a high-fidelity automated and reconfigurable multispectral imaging tracking system for integration into an RQ-4 Global Hawk as part of the overall SkyRange capability. Ground checkouts of the system were successful, and system modifications are being designed for integration onto the aircraft. The development is scheduled for system integration in FY 2022.</p> <p>The High-Altitude LIDAR Atmospheric Sensing (HALAS) system remains installed on a Gulfstream G-IV business jet. The G-IV continued to support flight test missions by collecting atmospheric data. The data collected informs the design of the HALAS system for integration on an unmanned RQ-4 Global Hawk as part of the overall SkyRange capability.</p> <p>A ground based multispectral thermal imaging prototype continued to collect thermal imagery in the terminal phase of a hypersonic flight tests for thermal protection system evaluation. The system was deployed to the Pacific to support terminal phase data collection for a hypersonic flight test, and the prototype successfully acquired thermal imagery data that was subsequently provided to the weapon system program. The system was then brought back to CONUS, where an enclosure was fabricated and installed on the unit to increase reliability. The system was then redeployed to the Pacific to support additional flight tests.</p> <p>Additional upgrades and technology development continued at the CUBRC hypersonic shock and expansion wind tunnels to support hypersonic ground testing. These included the implementation of a fast-response force and moment balances for use in the CUBRC facilities, and multiple non-intrusive diagnostic systems for evaluation of hypersonic systems. In addition to these upgrades, a new wave rotor facility development was initiated, starting with a small scale prototype wave rotor based multi-shock heater to demonstrate representative conditions at hypersonic speeds for aero-optic and thermal protection system testing.</p> <p>FY 2022 Plans: The HAPCAT will achieve full operational capability, providing support to hypersonic weapon system programs test capabilities for aerothermal, propulsion, and combined effects advanced sensor characterization. Other test techniques to support directed energy and other propulsion system characterizations will also be developed.</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>	Project (Number/Name) 091 / <i>High Speed Systems Test</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>SkyRange will demonstrate operation using multiple aircraft platforms, including RQ-4s and MQ-9s. Support will be provided to hypersonic flight tests using the telemetry, multispectral imaging, and atmospheric sensing sensor packages. This will involve the integration of the multispectral imaging sensor onto the RQ-4 and completion of the atmospheric sensing capability. Additionally, development of terminal scoring capabilities deployed from SkyRange assets will continue.</p> <p>Further technology upgrades to arc heaters and new aerothermal test capabilities will continue to address throughput and capability shortfalls. Other test and evaluation gaps associated with ground and flight test, modeling and simulation, and instrumentation will be addressed through new efforts.</p> <p>FY 2022 Congressional addition of \$83M improves shock tunnels and hypersonic flight testing. The improvements upgrade the large energy national shock tunnel capability to assess aerothermal and dynamic event effects on hypersonic, ballistic missile defense, and strategic systems and advanced sensors. The enhancements will deliver a prototype high-Mach, high-enthalpy ground test capability increasing the run time for high Mach, high enthalpy ground test capability matching flight conditions up to Mach 8. In addition, the Congressional increase will improve hypersonic flight test throughput will augment hypersonic launch capabilities and continue the prototype development of rapid, responsive flight test capabilities enabling an increase in the number of hypersonic flight test capabilities available to programs. These improvements will reduce schedule bottlenecks currently limiting hypersonic flight test throughput</p> <p>FY 2023 Plans: The HAPCAT will continue providing support to hypersonic weapon system programs test capabilities for aerothermal, propulsion, and combined effects seeker/sensor characterization. The HAPCAT will continue risk reducing test technologies as a pathfinder for the development of the larger-scale, more capable facility at the AEDC. Other test techniques to support directed energy and other propulsion system characterizations will also be developed.</p> <p>SkyRange will demonstrate initial capability using multiple aircraft platforms, including RQ-4s and MQ-9s. Support will be provided to hypersonic flight tests using the telemetry, multispectral imaging, and atmospheric sensing sensor packages. SkyRange will support terminal data collection for hypersonic flight tests by demonstrating terminal scoring capabilities deployed from SkyRange assets.</p> <p>Further technology upgrades to aerothermal test capabilities will continue. Other test and evaluation gaps associated with ground and flight test, modeling and simulation, and instrumentation will be addressed through new efforts.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>			
		FY 2023	

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>	Project (Number/Name) 091 / <i>High Speed Systems Test</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
FY 2022 to FY 2023 decrease reflects FY 2022 congressional addition of \$83M to improve large energy national shock tunnels hypersonic ground test facilities and hypersonic flight test throughput.			
Accomplishments/Planned Programs Subtotals		93.001	191.463
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>				Project (Number/Name) 092 / <i>Spectrum Efficient Technology</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
092: <i>Spectrum Efficient Technology</i>	78.296	4.700	39.376	9.975	-	9.975	10.053	10.192	9.586	9.777	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Weapon systems have become increasingly complex in recent years, resulting in the need for significantly more data to be passed among these systems as well as between the systems and our test infrastructure. A vast amount of data must be collected, transmitted, and analyzed, which requires a large amount of radio frequency (RF) spectrum resources. However, the amount of RF spectrum designated to support test and evaluation (T&E) is decreasing, most notably due to reallocation of spectrum for commercial use. The combination of decreasing RF spectrum and increasing data requirements results in an urgent need to develop test technologies that maximize the use of spectrum resources for the Department of Defense (DoD) T&E operations.

The L- and S- Band frequencies are the traditional spectrum allotted for military T&E use. The explosive need for spectrum in the commercial sector has resulted in reallocation of portions of these bands to industry. To compensate, the DoD is now authorized to use the C-Band spectrum which offers numerous benefits, including the potential for a large increase in available bandwidth, but the C-Band spectrum comes with technical challenges and regulatory constraints. Most notably, our current test infrastructure for telemetry is not designed to accommodate C-Band and the band is heavily shared for alternate uses. Technologies are required to implement innovative techniques that efficiently facilitate our use of C-Band without a major overhaul to our national test infrastructure. For instance, commercial telemetry transmitters operate in C-Band but do not have the form factor (size, weight and power) nor ruggedized packaging to survive airborne test applications.

Traditional telemetry applications employ streaming telemetry where data is moved one-way from the instrumented system under test to our test range infrastructure. Modern network based telemetry and cellular based telemetry capabilities enable more robust, efficient bidirectional transfer of data. The DoD strategy is to create technologies for implementing a telemetry capability in C-Band, using the legacy L- and S-Bands for both streaming and networked telemetry, and researching the feasibility of using higher frequency bands to augment telemetry operations.

The Spectrum Efficient Technology (SET) project is developing test technologies that enable more efficient use of legacy telemetry bands and expansion into non-traditional areas of the RF and optical spectra at DoD test ranges. The technology development efforts within the SET project have been prioritized to align with the Department of Defense guidance on science and technology priority investments. As such, the SET project is focusing on growing data requirements of warfighting systems and the limited availability of spectrum for testing. The SET project is structured to develop test technologies to advance range communications, networked and cellular based telemetry capabilities, and enhanced management of spectrum at DoD test ranges.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Spectrum Efficient Technology	4.700	39.376	9.975

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>	Project (Number/Name) 092 / <i>Spectrum Efficient Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>Description: The SET project transitioned the software tool capable of accurately estimating current and future spectrum needs. The tool accounted for actual versus scheduled utilization of the spectrum and quantified the cost and schedule implications of the loss of needed spectrum. The spectrum efficient metrics tool provides spectrum managers a planning tool and also provides justification data needed to retain spectrum. The SET project continued to mature technologies required for network and cellular based telemetry. Airborne phased array telemetry antenna technologies were matured for both manned and unmanned platforms, to include demonstration of airborne phased array telemetry data collection. The SET project completed development and integration of a small, lightweight data recorder and data transmission scheme integrated onto unmanned airborne platforms to support long range flight test telemetry data collection. The data recorder addressed long range flight test requirements for data recording and storage during flight testing.</p> <p>FY 2022 Plans: The SET project will further advance development of technologies required for network and cellular based telemetry. Airborne phased array telemetry antenna technologies will continue to be matured for both manned and unmanned platforms by optimizing antenna designs for specific long range flight test requirements. Ground based phased array telemetry antenna technologies to support large footprint flight test events will continue to be matured. The SET project will also continue to leverage cellular technologies to support aeronautical telemetry requirements.</p> <p>The FY 2022 Congressional addition of \$30M will initiate efforts to prototype 5G test environments needed to assess commercial 5G operation impacts on critical test data transmission in operationally relevant test environments. This enables the DoD to replicate, assess, and address the impacts of a congested 5G environment in test, training, and operational exercises relevant to wartime theater conditions.</p> <p>FY 2023 Plans: The SET project will continue development of technologies required for network and cellular based telemetry. The SET project will begin transition of cellular technologies to support aeronautical telemetry requirements at open air test ranges. Airborne and ground based phased array telemetry antenna technologies will continue to be matured. Ground based phased array telemetry antenna technologies to support large footprint test events will be demonstrated.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2022 to FY 2023 decrease reflects FY 2022 congressional addition of \$30M to prototype 5G test environments, and improve spectrum usage during test events.</p>			
Accomplishments/Planned Programs Subtotals		4.700	39.376
			9.975

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>	Project (Number/Name) 092 / <i>Spectrum Efficient Technology</i>
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>	Project (Number/Name) 093 / <i>Electronic Warfare Test</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
093: <i>Electronic Warfare Test</i>	114.592	13.200	121.171	119.265	-	119.265	105.055	71.619	40.073	40.874	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In order to establish dominance in the modern battlespace, our offensive and defensive electronic warfare systems must be capable against advanced radio frequency (RF) directed threats and electro-optic (EO) guided threats, which include infrared (IR) guidance. Ensured dominance in these areas requires more robust test and evaluation (T&E) with technologies that are rapidly adaptable to changing threats.

Readily available, IR seeking, man-portable air defense systems (MANPADS) are difficult to detect and pose an imminent and lethal threat to military aircraft of all types. Our ability to counter such threats is essential to owning the battlespace in theater. Therefore, the ability to test missile warning systems (MWS), hostile fire indicator (HFI) systems, IR countermeasures (IRCM), and advanced threat sensors is critical to our national defense. Additionally, a new generation of enemy RF missile seekers is both currently fielded and in further development, requiring a correspondingly new generation of test technologies to test the latest countermeasures. The T&E community is required to test IRCM and RF countermeasure systems in a repeatable manner with ground-truth data before and after integration into warfighting systems. Without new test technologies, the Department of Defense (DoD) will be unable to perform adequate T&E of advanced warning and countermeasure systems.

The Electronic Warfare Electronic attack and Electronic protect (EP) community is developing jammers and EP measures that are more sophisticated and take advantage of newer technology that allows adaptive waveforms and artificial intelligence and autonomy to respond to threats more rapidly and robustly. In addition, the testing of these systems in realistic many on many environments that are more threat representative requires new technology investment.

The technology development efforts within the Electronic Warfare Test (EWT) project have been prioritized to align with DoD guidance on science and technology priority investments. As such, the EWT project is focusing on the test needs in both the EO, including IR, and the RF threat domains. Additionally, development of core test technologies in this area can be leveraged to meet other EO and RF test requirements, such as in fire control systems; intelligence, surveillance and reconnaissance (ISR) sensors, and weapon seekers.

The EWT project develops test technologies to stimulate IRCM and RF system sensors through the high-fidelity simulation of scenes viewed by the sensors. Stimulation can be as simple as testing to see if a system under test responds to an image or as complex as simulating complex battle space phenomena to measure the response of a system under test in a more relevant, cluttered scenario. Simulations and stimulations are used at open air ranges and in installed system test facilities (ISTF), and in hardware-in-the-loop (HWIL) test beds.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Electronic Warfare Test	13.200	121.171	119.265

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>	Project (Number/Name) 093 / <i>Electronic Warfare Test</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>Description: The EWT project continued to develop high fidelity scene generation technology for both EO and RF environments. Work continued on the development of hardware and software that generates large number of independent radar targets in a high fidelity hardware-in-the-loop facility. This enabled chamber testing of radars in more dense target environments by generating large numbers of dissimilar false targets. Work continued on high temperature IR scene projectors. The EWT project developed a dynamic infrared (IR) scene projector to enable chamber testing of missile warning systems and directional infrared countermeasure systems. The new scene projector creates scenes with higher temperatures and higher resolution creating a more threat representative environment for sensor test. The effort transitioned and delivered scene projectors to the Air Force Guided Weapons Evaluation Facility (GWEF). Work continued on increasing the efficiency of LED pixels for use in IR scene projectors. Work continued on development of interfaces for use of Active Electronically scanned arrays for open air range threat simulators.</p> <p>FY 2022 Plans: The EWT project will continue investments in Digital RF memory for adaptive waveforms. The EWT project will invest in technologies related to Cyber and EW convergence. The EWT project will invest in technologies related to Cognitive EW, Cognitive Radar, and EW sensors that feed Artificial Intelligence uses of EW data. Investments in open air range threat emitter prototypes to enable wider frequency coverage featuring frequency agility to replicate modern threat system behaviors for operational test will be initiated. EWT will conduct studies to improve Ground EW systems and cUAS EW testing.</p> <p>FY 2022 Congressional addition of \$41M improves the technologies needed to test 5th/6th generation aircraft. These upgrades will continue the prototype development of an aerial target system to adequately replicate adversary 5th generation stealth aircraft with representative attributes such as low observability, maneuverability, size, and electronic warfare payload capabilities. These upgrades will also initiate the prototype development of an instrumented, threat-representative small unmanned aircraft system (sUAS) threat for counter-sUAS testing. The development and deployment of these capabilities allows the Department to test and train against representative targets to accurately assess blue force lethality and survivability</p> <p>FY 2023 Plans: The EWT project will continue investments in technologies related to Cognitive EW, Cognitive Radar, and EW sensors that feed Artificial Intelligence uses of EW data. EWT will initiate technology developments to improve Ground EW systems and cUAS EW testing. Prototype open air range threat emitter with wider frequency coverage and agility will be demonstrated.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>	Project (Number/Name) 093 / <i>Electronic Warfare Test</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
FY 2022 to FY 2023 increase reflects FY 2022 congressional addition of \$41M to upgrade target lab and test range infrastructure combined with program increases to better address modern adversarial electronic warfare threats in lab and range test environments.			
Accomplishments/Planned Programs Subtotals		13.200	121.171
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>				Project (Number/Name) 094 / <i>Advanced Instrumentation Systems Technology</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
094: <i>Advanced Instrumentation Systems Technology</i>	87.301	15.420	11.209	12.180	-	12.180	12.462	12.710	12.977	13.237	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Advanced Instrumentation Systems Technology (AIST) project addresses the test technology gaps resulting from emerging weapon systems that need to be assessed at the Department of Defense (DoD) installed systems test facility and hardware-in-the-loop testing (ISTF/HITL) and open-air range (including tropospheric, land-based, open-ocean, and undersea ranges) test facilities. Instrumentation requirements for systems under test are increasing exponentially for new weapons systems. System-borne, warfighter-wearable, and remote sensing instrumentation packages are required. This instrumentation is for sensing and collecting critical performance data; determining accurate time, space, position information (TSPI) and attitude information; interfacing with command and control data links; monitoring and reporting system-wide communications; recording human operator physical and cognitive performance; and storing and transmitting data.

The technology development efforts within the AIST project have been prioritized to align with the DoD guidance on science and technology (S&T) communities of interest (COIs). The AIST project is focused on developing technologies for advanced TSPI instrumentation (especially with limited or no availability of Global Positioning System (GPS) signals), advanced sensors, advanced energy and power systems for instrumentation, non-intrusive instrumentation, mitigating range encroachment issues, and measuring warfighter physical and cognitive performance. The AIST project addresses requirements for miniaturized, non-intrusive instrumentation suites with increased survivability in harsh environments. Such instrumentation is an urgent need because minimal space is available to add instrumentation to new or existing weapon systems subsequent to their development; furthermore, additional weight and power needs for instrumentation can adversely affect weapon system signature and performance. Instrumentation for humans-in-the-loop, especially dismounted warfighters, must not adversely affect performance, induce artificiality in the test environment, nor create any operational burdens. New technologies can be exploited to integrate small, non-intrusive instrumentation (micro-technology) into emerging platforms during design and development, and, in some cases, into existing platforms. This class of instrumentation will provide critical system performance data during operational test (OT) and continuous assessment throughout a system's lifecycle. Technology developed under AIST can also benefit training and combat missions by enabling a continual feedback loop between the developer, training staff, operators, and commanders.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Advanced Instrumentation Systems Technology	15.420	11.209	12.180
Description: Major thrusts included initiating and continuing efforts in advanced sensors, and TSPI instrumentation. The AIST projected initiated two efforts to design a test technology for weapon testing use cases impacting the broad ocean area to collect TSPI, lethality, and scoring data; one technology will use optics, and the other will leverage an imaging radar and subsurface acoustic sensors.			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>		Project (Number/Name) 094 / <i>Advanced Instrumentation Systems Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>The AIST project initiated an effort to develop a sensor to collect acceleration measurement data during high-speed flight tests, enabling the gathering of accurate position and attitude, 6 Degrees of Freedom (6DOF) data over very long ranges and into the exo-atmosphere to measure the aerodynamics and internal guidance and control systems of new munitions in an ultra-high dynamic environment.</p> <p>The AIST project continued an effort to support testing of military aircraft using externally mounted sound pressure instrumentation to gather data for analysis in all weather conditions, to overcome current constraints to flight testing in dry environments.</p> <p>The AIST project continued a portable technology development effort using acoustic signatures to measure weapon location and attitude to characterize high dynamic weapon end-game maneuvers, and to evaluate impact location & velocity of attacking projectiles and resolving (scoring) very large quantities of impacts occurring closely spaced in position and/or time.</p> <p>The AIST project completed an effort in developing a high fidelity model which takes into account the noisier acoustic properties of shallow water environments for littoral T&E. The model supports early evaluation of undersea test range technologies (e.g., hydrophone arrays, new communication signals/modulations, transducers, and portable instrumentation).</p> <p>The AIST project completed an effort related to electro-releasable attachment technology development. This included the investigation of new adhesive formulations that employ an electrically-releasing tape to allow for the attachment of sensors to non-conductive, painted surfaces of aircraft and other combat vehicles and significantly reduce the time to restore the system under test to its operational configuration. Efforts improved adhesion strength and ease of use. This effort was successfully tested in a relevant environment in field testing onboard M1-Abrams Tanks at Aberdeen Test Center, and F-15 Fighter Jets at Edwards Air Force Base, respectively.</p> <p>FY 2022 Plans: The AIST project will complete the technology development of a portable end-game scoring system implementing deep ocean synchronized acoustic recorders, and continue developing a broad ocean area test technology suite. The AIST project will initiate a mobile undersea tracking effort to provide TSPI on subsurface weapons and vehicles.</p> <p>The AIST project will also continue the investigation and development of advanced instrumentation technologies to support lethality testing and end-game scoring in the broad ocean area.</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>	Project (Number/Name) 094 / <i>Advanced Instrumentation Systems Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>The AIST project will continue to develop a sensor to collect acceleration measurement data during high-speed flight tests, enabling the gathering of accurate position and attitude, 6DOF data over very long ranges and into the exo-atmosphere to measure the aerodynamics and internal guidance and control systems of new munitions in an ultra-high dynamic environment</p> <p><i>FY 2023 Plans:</i> The AIST project will continue development of: multi-disciplinary technologies addressing T&E requirements for real-time casualty assessment (RTCA) of warfighter and weapon engagements, sensors to support advanced hypervelocity projectile testing, TSPI data fusion algorithms and technologies, high precision range radar technology, improved energy and power density systems for T&E, advanced non-intrusive data management techniques, and mitigation technologies for monitoring effects from encroachment on test ranges. The AIST project will also continue the investigation and development of advanced instrumentation technologies to support lethality testing and end-game scoring in the broad ocean area.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> There were no significant changes between FY 2022 and FY 2023.</p>			
Accomplishments/Planned Programs Subtotals		15.420	11.209
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603941D8Z / Test and Evaluation Science and Technology				Project (Number/Name) 095 / Directed Energy Test			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
095: Directed Energy Test	82.937	7.800	21.568	11.322	-	11.322	11.475	11.705	11.950	12.188	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Department of Defense (DoD) is exploring the military utility, safety, and suitability of directed energy weapons. A robust test capability to assess directed energy weapons is essential to understanding their effectiveness and limitations, including determining their effectiveness in performing counter improvised explosive device (C-IED) operations and counter UAS operations. Such assessments will depend upon knowledge acquired through the test and evaluation (T&E) of directed energy technologies and testing of operational concepts. Directed energy weapon technologies, primarily consisting of high energy lasers (HEL) and high powered microwaves (HPM), are outpacing available test capabilities. Traditional test techniques for evaluating conventional munitions (with flight times ranging from seconds to minutes) are not sufficient for the T&E of directed energy weapons that place energy on target instantaneously. Consequently, new test technology solutions are needed to ensure that adequate developmental, live-fire, and operational test capabilities are available when directed energy programs are ready to test.

Directed energy system and component testing requires three principal assessments: (1) energy or power on target; (2) the effects on the target; and (3) the propagation of the directed energy to the target through the atmosphere. In addition, the vulnerabilities of DoD systems to directed energy threats are required to be characterized, such as those requirements captured in Military Standard (MIL-STD)-464C. Equally as important, current test capabilities do not provide the detailed data required to understand U.S. directed energy system performance and effects. The technology development efforts within the Directed Energy Test (DET) project have been prioritized to align with DoD guidance on science and technology priority investments. As such, the DET project is developing the technologies necessary for quantitative assessment of United States (U.S.) HEL and HPM performance, as well as the vulnerability of DoD weapon systems to enemy directed energy threats.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Directed Energy Test	7.800	21.568	11.322
Description: The DET project continued efforts to measure HEL energy on small targets such as mortars, rockets, artillery, and UAS. The effort designed a recoverable mortar prototype to address Army and Navy requirements and an Air Force requirement for a missile-mounted target board. The DET project continued efforts to develop M&S capability for assessing effects of threat HEL systems on blue aircraft.			
The DET project completed efforts to mature a dense plasma focus technology to produce strategically relevant, ultra-short pulse neutron fluence levels for nuclear vulnerability testing. The DET project successfully demonstrated neutron production and dense plasma focus technology development continues to be optimized to support neutron production rates scalable to a test facility to be developed by the Central Test and Evaluation Investment Program (CTEIP). A larger chamber was integrated into the facility to test obtaining higher			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>	Project (Number/Name) 095 / <i>Directed Energy Test</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>FY 2022 Plans: The DET project will continue developments in HEL test technologies and HPM test technologies to characterize the performance and effectiveness of HEL and HPM systems as they engage small targets, such as enemy rockets, missiles, artillery, and unmanned aerial vehicles, as well as electronic systems and other targets of interest and expand into larger UAS classes. This will include sensor and associated data collection systems that can survive an HPM environment. DET will complete atmospheric modelling work that will allow the development of HEL predictive atmospheric propagation. DET will complete developing wide band HPM sources for assessing the performance of US systems in a hostile HPM environment. The DET project will continue the development of software and measurements to assess the survivability of DoD aircraft against HEL threats. DET will invest in aero-optics effects characterization tools. DET will invest in lower noise, broader band E-field measurement sensors for HPM characterization. DET will continue development and transition of capability at the High Energy Laser Systems Test Facility (HELSTF) to engage missile targets for a demonstration in late 2022.</p> <p>FY 2022 Congressional addition initiate efforts to develop required instrumentation on the missile and sUAS target to assess High Power Microwave (HPM) effects. Upgrades will also include development of off-board sensors that can assess the performance of the HPM weapon system's detection, identification, tracking, fire control, and battle damage assessment. Upgrades will enable mobile, relocatable testing infrastructure (whereas currently HPM test facilities can only support static testing). Upgrades will also focus on the development and employment of validated models of HPM effects to accurately predict the effects of HPM on missile and sUAS systems and embedded electronics. Validated models are needed to inform HPM waveform developers as they optimize the HPM effect on target.</p> <p>FY 2023 Plans: The DET project will continue developments in HEL test technologies and HPM test technologies to characterize the performance and effectiveness of HEL and HPM systems as they engage small targets, such as enemy rockets, missiles, artillery, and unmanned aerial vehicles, as well as electronic systems and other targets of interest and expand into larger UAS classes. This will include sensor and associated data collection systems that can survive an HPM environment. Finally, the DET project will continue development of HELSTF capability to engage missile targets for a demonstration in FY 2023 against supersonic targets.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2022 to FY 2023 decrease reflects FY 2022 congressional addition of \$11M to upgrade directed energy lab and test range infrastructure.</p>			
Accomplishments/Planned Programs Subtotals		7.800	21.568
		11.322	

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>	Project (Number/Name) 095 / <i>Directed Energy Test</i>
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603941D8Z / Test and Evaluation Science and Technology				Project (Number/Name) 096 / C4I & Software Intensive Systems Test			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
096: C4I & Software Intensive Systems Test	129.746	14.610	12.128	13.088	-	13.088	13.246	13.511	13.794	14.070	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Command, Control, Communications, Computers, Intelligence (C4I) and Software Intensive Systems (SIS) (C4T) project addresses test technology gaps in the rapid advancement of C4T warfighting systems. The C4T technology gaps are driven by the more complex environments and distributed systems (e.g. Anti-Access Aerial Denial (A2AD); Manned and Unmanned Systems (MUM-T)); big data and intelligence (e.g. Artificial General Intelligence (AGI) and Machine Learning Algorithms (MLA)); and more software intensive systems (e.g. F-35). The technology development efforts within the C4T project have been prioritized to align with DoD guidance on S&T Communities of Interest (Cols) and the National Defense Strategy. The C4T is developing technologies, including leveraging advancements in machine learning, to analyze and evaluate the increasing mass of structured and unstructured data generated by C4I and SIS testing. The technologies are required when testing sensor platforms, command and control systems and weapon platforms that support the kill chain in a Joint operation. These systems must be evaluated for their ability to provide the accurate, timely transfer of data (e.g. target tracks, weapons allocation, mission tasking, and situational awareness) as the data passes among the Services and coalition participants. The technologies within C4T will remove undesired distributed testing biases while improving test agility and the tester's ability to effectively support knowledge management, rapid analysis of "Big Data," and automated test reporting. The C4T project advances test technologies for next generation resilient, survivable, federated networks and information ecosystems (information superiority) from the tactical level up to strategic planning; as well as Big Data collection, analysis, and visualization that enable the virtual integration of Department of Defense (DoD) weapon laboratories and open air ranges. Using Modeling and Simulation (M&S) along with hardware-in-the-loop (HWIL) laboratories, the effectiveness of Joint missions can be assessed in terms of system-of-systems interoperability and effectiveness in executing Joint mission operations, including testing of weapons and C4I and SIS systems accessing and providing information.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: C4I and Software Intensive Systems Test	14.610	12.128	13.088
<p>Description: The C4T project completed development of AI technologies in multiple areas of "Big Data" rapid analytics of large structured and unstructured datasets in support of F-35 Test and Evaluation (T&E). This includes developing technology that employs unsupervised machine learning to assist humans to analyze, extract, & manage actionable knowledge from many varied large data sets (not just F-35); using Human-Like reasoning to identify insights from structured and unstructured data; enable distributed testers to use shared knowledge to identify critical test information. This effort transitioned to the JSF Joint Program Office and Edwards AFB Test Pilot School.</p> <p>The C4T project completed development of M&S technologies to support real-time assessments of torpedo performance in complex undersea environments, specifically for shallow water (<50 meters). These technologies provide an acoustic propagation model for both narrow and broad band, of sufficient fidelity to be used for the next generation of torpedo development as well as</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>	Project (Number/Name) 096 / <i>C4I & Software Intensive Systems Test</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>testing torpedo performance in various maritime tactical environments that cannot be assessed with live in-water testing. The model includes a real-time simulation/emulation system for design and testing the next generation of torpedo sonar systems in multiple bathymetry, biological and threat environments. This effort transitioned to naval undersea weapons and unmanned vehicle programs.</p> <p>The C4T project completed development of a network M&S to achieve configuration optimization of test support networks. Technologies included planning expeditionary tests, managing bandwidth and spectrum contention with a networked system under test, managing power consumption providing a continuous re-planning capability. These technologies will address deficiencies in Army Operational Test (OT) for network-enabled technologies to support the Operational Test Command at Ft. Hood, Texas.</p> <p>The C4T project initiated the development of several big data analytics (BDA) efforts implementing artificial intelligence/ machine learning (AI/ML) techniques for multi-variant time series sensor datasets, unstructured dataset analytics (audio, video, and imagery), and advanced visualization of large T&E datasets. These efforts include: traditional statistical and machine learning techniques to deal with massive complex datasets; containerized microservices architecture to support systemic analysis utilizing advanced analytics (ML/AI algorithms); advanced data synchronization and fusion framework and services allowing users to correlate and assess multivariate data types for operational test analysis; cloud-based microservices framework to speed synchronization of text format outputs by ML models and accompanying metrics on precision and recall for audio, video, and imagery large T&E datasets; collection, analysis and visualization of multi-variate data across system lifecycle; advanced visualization techniques; browser-based visualization technology to easily ingest massive data sets from multiple sources, store data locally for enrichment purposes, and export data and analytical products; and browser-based client-server Data Observatory visualization technology that reinvents the presentation of information by abstracting data into particles to optimally exploit current vision and neuroscience research allowing the analyst to receive the most information without focusing on each piece individually. These technologies are being developed to support test and evaluation of future warfighter C4I and Software Intensive Systems (4th and 5th generation military platforms).</p> <p>FY 2022 Plans:</p> <p>The C4T project will continue the development of several big data analytics (BDA) efforts implementing artificial intelligence/ machine learning (AI/ML) techniques for multi-variant time series sensor datasets, unstructured dataset analytics (audio, video, and imagery), and advanced visualization of large T&E datasets. These efforts will continue work targeted at technologies for analysis of large test databases for the F-35 and will become tailored for use by ranges supporting live testing for the aircraft along with technologies to assist analysts with the reduction of large complex TSPI datasets. These technologies will continue being</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>	Project (Number/Name) 096 / <i>C4I & Software Intensive Systems Test</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>developed to support the test and evaluation of future warfighter C4I and Software Intensive Systems (4th and 5th generation military platforms).</p> <p>FY 2023 Plans: The C4T project will continue to advance test technology development to enable the next generation resilient, survivable, federated networks and information ecosystems (information superiority) from the tactical level up to strategic planning across three domains: BDA, Live and Simulated Environments, and Test Automation.</p> <p>The C4T project will continue to focus on testing more advanced technologies to assess big data warfighter systems implementing advanced algorithms and computer architectures.</p> <p>The C4T project will investigate the increased use of live and simulated test environments using test environment driven M&S validation techniques.</p> <p>The C4T project will investigate the increased use of test automation utilizing virtualization and cloud environments.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Program Adjustments</p>			
Accomplishments/Planned Programs Subtotals		14.610	12.128
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>				Project (Number/Name) 097 / <i>Autonomy and Artificial Intelligence Test</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
097: <i>Autonomy and Artificial Intelligence Test</i>	66.149	8.450	11.087	22.742	-	22.742	24.028	30.858	32.752	31.248	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Unmanned and autonomous systems support every domain of warfare -- operating in space, in air, on land, on the sea surface, undersea, and in subterranean conditions to support a vast variety of missions. The emergence of Artificial Intelligence (AI) brings a host of revolutionary capabilities that will profoundly influence warfare, and bring special challenges for testers of Artificial Intelligence systems. The Unmanned Autonomous System Test (UAST) project addresses current and emerging challenges associated with the test and evaluation (T&E) of unmanned systems, particularly in testing autonomy, artificial intelligence, and machine learning. As such, the UAST project is developing test technologies to simulate, stimulate, instrument, measure, and assess an autonomous system's ability to perceive its environment, process information, adapt to dynamic conditions, make decisions, and effectively act on those decisions in the context of mission execution.

The AAIT project will provide the test technologies to effectively measure performance and characterize risk, thereby increasing warfighter trust in autonomous systems and artificial intelligence tools. The current DoD test capabilities and methodologies are insufficient to address the testing of increasingly autonomous units operating in unstructured, dynamic, battlespace environments. Furthermore, advancements are being made in developing collaborating, system-of-autonomous-systems that will work in concert as a swarm or pack, and in close proximity with humans. New test technologies are needed to stress the collective set of autonomous systems under realistic conditions, predict emergent behavior of autonomous systems, emulate the complex environment, and assess mission performance of these highly-coupled and artificially-intelligent systems.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Autonomy and Artificial Intelligence Test	8.450	11.087	22.742
<p>Description: The AAIT Project continued test technology development supporting the DoD Unmanned Systems such as, integrating the DoD unmanned systems within the National Airspace and safely operating unmanned aerial systems within the Major Range and Test Facility Bases (MRTFB). The AAIT project collaborated with the Autonomy Community of Interest (COI) Test and Evaluation, Verification and Validation (TEVV) Working Group to ensure that the AAIT project is investing in technologies relevant to the future of autonomous systems. The AAIT Project seeks solutions for legacy topics (test planning, test execution, safety, and performance assessment) but has also expanded our interest to ensure solutions for Artificial Intelligence and Machine Learning systems, topics identified by the intelligence community, and any other topics that are priority for TRMC and OUSD(R&E).</p> <p>The AAIT project continued the Assured DevSecOps of Autonomous Systems (ADAS) effort. ADAS addresses the unique challenges of Autonomy test & evaluation to provide enterprise solutions in support of future programs and joint initiatives. ADAS</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603941D8Z / Test and Evaluation Science and Technology		Project (Number/Name) 097 / Autonomy and Artificial Intelligence Test	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
addresses autonomy test and evaluation verification and validation (TEV&V) needs across the life cycle beginning with mission analysis and engineering and ending with the mission operations. ADAS is a leading pathfinder effort to address gaps identified by the National Security Commission on Artificial Intelligence.					
The AAIT Project continued investments in robustness testing technology to detect and predict safety-related vulnerabilities and failures within UAS software. The AAIT project is risk reducing Autonomy, Integration, and Teaming (AIT) test capability development, by providing autonomy test tools to be demonstrated on the Airborne Collision Avoidance System (ACAS-Xu) on Triton, and to test the Guardian Ground Based Detect and Avoid software, which will allow it to achieve certification for use during live test (DO-278A/NAVAIR Cert). The same technologies are risk reducing Autonomous Systems Test Capability (ASTC) development. The AAIT project used DARPA Collaborative Operations in Denied Environments (CODE) as a test case for this robustness technology, identifying and reporting on safety vulnerabilities found deep within the software, further identifying the conditions required to trigger the safety defects.					
The AAIT Project completed development of technology to improve test planning for ground and air autonomy using optimization algorithms to rapidly generate salient test scenarios. The integrated autonomy simulation will be used to validate AAIT technologies in the ground domain. New architecture and state-space designs better support multiple domains of autonomy testing. Unmanned Ground Vehicle and Undersea Vehicle domains test technology development will risk reduce the CTEIP autonomous test capability development efforts.					
The AAIT Project initiated development of technology to create machine-learned, behavioral copies of autonomy software. This technology creates faster-than-real-time versions of a given autonomy that can then be tested in an accelerated timeline in a simulated environment, and can also be cloned to be tested in parallel-processing fashion. This technology will provide faster, better, and more statistically significant testing data for testers.					
FY 2022 Plans: The AAIT Project will continue to establish initial operational capability for ground based UAS detect and avoid capability to facilitate integration of UAS testing into federal (manned/unmanned) airspace. The AAIT project will also continue prototyping hardware in the loop test environments for safety of flight for fully autonomous UAS at Edwards AFB, CA.					
The AAIT project will continue investments in robustness testing technology to detect and predict safety-related vulnerabilities and failures within UAS software. The AAIT Project will continue development of technology to create machine-learned, behavioral copies of autonomy software.					
FY 2023 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>	Project (Number/Name) 097 / <i>Autonomy and Artificial Intelligence Test</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>The AAIT Project will initiate technology development to generate relevant synthetic data to train AI algorithms. AAIT will also develop and deploy new test techniques, referred to as data collection at the edge, to automate the collection, storage, tagging, and analysis of data during live DoD test events with systems under test employing autonomy and artificial intelligence algorithms. The AAIT Project will continue to initiate and develop technologies to support test planning, test execution, and performance assessment of unmanned, autonomous, artificial intelligence, and machine learning systems.</p> <p>ADAS will continue to deliver pathfinding solutions of transformational capabilities addressing the full spectrum of TEV&V needs. AAIT will continue to transition technologies to end users at the labs and ranges of the MRTFB. AAIT will continue to risk reduce test capability development. AAIT will investigate concepts to verify the autonomy design models against design requirements using formal methods, and a Test-Case Execution Environment based on AI-guided Testing, using machine-learning in the test planning process to make recommendations of test conditions for evaluation of machine learning image classifiers.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> FY 2023 funding increase reflects improving test tools and algorithms for trusted artificial intelligence (AI) and autonomous systems to accelerate initiatives in partnership with the Joint Artificial Intelligence Center.</p>			
Accomplishments/Planned Programs Subtotals		8.450	11.087
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603941D8Z / Test and Evaluation Science and Technology				Project (Number/Name) 098 / Cyberspace Test			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
098: Cyberspace Test	53.361	14.710	13.348	14.431	-	14.431	14.707	15.000	15.315	15.620	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The Department of Defense (DoD) ability to use cyberspace for rapid communication and information sharing in support of operations is a critical enabler of DoD military missions. Advancements in utilizing cyberspace are outpacing the technologies needed for test and evaluation (T&E). The Cyberspace Test Technology (CTT) project develops advanced technologies and methodologies to test and evaluate DoD capabilities and information networks to defend and conduct full-spectrum military operations across cyberspace. Current cyberspace T&E capabilities are insufficient to support the continual experimental, contractor, developmental, operational, and live-fire testing requirements of warfighter systems operating in cyberspace. Many of the test tools and infrastructure items required for systems in cyberspace will require advancement and maturation of nascent test technologies. The CTT project will address test technology shortfalls in cyberspace testing, including planning cyberspace tests, creating representative cyberspace threats and test environments, executing cyberspace tests, and performing cyberspace test analysis and evaluation.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: Cyberspace Test									14.710	13.348	14.431	
Description: The CTT project continued development of technologies to detect, monitor, and analyze malware behavior during cyber-attacks in a virtualized T&E environment. This technology development works to enable analysis and threat assessments to understand impacts to systems under test. The CTT project continued development of a capability to systemically verify (attest) that all persistent storage in an aircraft’s avionics subsystems have not been altered. This technology development works to ensure that a weapon system has not been modified by malicious action or legitimate cyber T&E activities.												
The CTT project is developing a next generation Traffic Generation and Content System that uses modern Artificial Intelligence techniques and detailed network, human social, and work flow models to generate traffic. This technology development works to ensure host and network traffic that is easily distinguished from human generated traffic. The CTT project is developing the novel capability to fuzz target’s virtual machine state. This technology enables exploring an entirely new class of attacks compared to existing fuzzers which fuzz only the program inputs. The CTT project is developing a framework to provide the red team and other DoD test organizations an automated attack capability. This technology development enables red team personnel to focus on more challenging problems and other test organizations to conduct automated testing.												
FY 2022 Plans:												
The CTT project will continue to develop test technology addressing needs in Cyber-Physical Systems, in Tactical Edge Networks, and in Enterprise Information Systems. The CTT project will continue development of cyber test tools enabling black-box fuzzing												

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>	Project (Number/Name) 098 / <i>Cyberspace Test</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>of arbitrary software in a virtualized environment. The CTT project will complete the development of a test technology capable of verifying that an aircraft's avionics have not been altered from a cyber attack. CTT will continue developing test tools and architectures to provide cyber red teams and other DoD cyber test organizations an automated attack capability. The CTT project will continue to develop a new traffic generation and content system that uses modern techniques to generate traffic realistic network traffic.</p> <p>FY 2023 Plans: The CTT project will continue to pursue technology developments addressing needs in Cyber-Physical Systems, in Tactical Edge Networks, and in Enterprise Information Systems. This includes the development of tools to measure the efficacy of cyber testing events and share anonymized results for all DoD testing. CTT also plans to develop more tools for red team automation. In addition CTT plans to demonstrate the new traffic generation and content system in a relevant test environment.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Program Adjustments.</p>			
Accomplishments/Planned Programs Subtotals		14.710	13.348
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>				Project (Number/Name) 099 / <i>Space Test</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
099: <i>Space Test</i>	0.000	0.000	43.500	0.725	-	0.725	0.830	0.908	1.142	1.165	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

As a new start in FY 2022, the Space Test project mission is to address national test capability gaps by providing accurate, robust, and efficient T&E solutions to successfully develop, validate, and inform the employment of new space control systems. The space domain has become a competitive, congested, and contested environment dominated by global economics and key to national security. The Department of Defense (DoD) is prioritizing investments to maintain space superiority and increase resiliency of legacy space systems as well as new space control systems. Current developments focus on deploying capabilities and systems to deter aggression and maintain freedom of action in space for the US, allies, and partner nations. Current testing infrastructure and methodologies to assess space system resilience against emerging threats is limited. The Space Test project addresses test technology needs for adequate realism for space systems and aligns with the DoD S&T priority investments. The Space Test project is developing a strategic roadmap and investment strategy to establish live and virtual range environments, develop space and ground-based threat emulation capabilities. The Space Test project develops technologies to enable robust, accurate, and timely T&E of future space weapon systems, and to ensure system suitability and survivability. Current test resource capability and capacity preclude accurate determination of future space system lethality and survivability.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Space Test	0.000	43.500	0.725
Description: The Space Test (ST) project is conducting a test infrastructure gap analysis on the needs of testing space systems and is developing a time-phased investment strategy based on those requirements. Work includes engaging the space test community on needs and gaps to ensure traceability of test technology development to strategic objectives.			
FY 2022 Plans: Stand up a Space Test project within the T&E/S&T Program to pursue technology developments addressing test technology needs in Space Systems across DoD and National Organizations. The Space Test project will identify test technology needs from the Space T&E investment roadmap. The Space Test project will also initiate the detailed design of a prototype space based telemetry system to support long range flight test objectives and data collection needs.			
FY 2022 Congressional addition of \$43M will initiate efforts to upgrade space test facilities with new test technologies enabling space systems to be more reliably and accurately tested on the ground prior to launch. The project will also upgrade capabilities to validate space domain awareness enhancements, as well as capabilities to support dedicated tracking and imaging of systems as part of the development of a National Space Test and Training Complex. There is no live space range for test analogous to test ranges for other warfighting domains, and the ability to have instrumentation to track space range activity is foundational to a			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603941D8Z / <i>Test and Evaluation Science and Technology</i>	Project (Number/Name) 099 / <i>Space Test</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>test range capability. These upgrades support the acceleration and validation of critical enabling technologies to improve space domain awareness and resiliency in the contested space environment.</p> <p><i>FY 2023 Plans:</i> The Space Test project will begin to address test technology needs identified in the Space T&E investment roadmap and time-phased investment strategy. Continued design and initial development of a space based telemetry system to support long rang flight test needs will continue.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> FY 2022 to FY 2023 decrease reflects FY 2022 congressional addition of \$43M to upgrade space ground testing facilities and to upgrade space test lab and range infrastructure.</p>			
Accomplishments/Planned Programs Subtotals		0.000	43.500
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)</i>					R-1 Program Element (Number/Name) PE 0603950D8Z / <i>National Security Innovation Network</i>							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	37.658	38.532	36.203	22.028	-	22.028	21.955	21.882	21.746	22.180	-	-
845: <i>National Security Innovation Network</i>	37.658	38.532	36.203	22.028	-	22.028	21.955	21.882	21.746	22.180	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Departments initiatives to Build a Sustainable and Long-Term Advantage, and Build a Resilient Joint Force and Defense Ecosystem.

The National Security Innovation Network (NSIN) is a program office within the Office of the Under Secretary of Defense for Research and Engineering (USRE) and authorized through Section 219 of the National Defense Authorization Act for FY 2021. NSIN reports through the Defense Innovation Unit (DIU) to the Undersecretary of Defense for Research and Engineering. NSIN has been chartered with a mission to build networks of innovators that generate new solutions to national security problems. NSIN develops programs that are designed to help other Department of Defense (DoD) entities from the Military Services, Joint Staff, Combatant Commands, Defense Agencies, and Field Activities solve problems with non-traditional partners from academia and the start-up community. NSIN is organized around three core lines of effort. These lines of effort include: 1) creating new opportunities for National Security Service by building models of service that account for generational and cultural differences between the military, academic, and venture communities, engaging a greater cross-section of the nation's talent in national security, and providing flexible pathways to official service within the Department of Defense; 2) solving national security problems by collaborating with partners from the academic and venture communities by engaging new problem-solvers in collision events with DoD customers that generate novel concepts and solutions and building a national network of problem-solving ecosystems that leverage the competitive advantages of regions and commercial innovation hubs for DoD customers; and 3) accelerating the adoption of novel concepts and solutions by facilitating engagement with DoD end-users and transition partners to stimulate dual-use venture growth and improving Technology Transfer and Transition (T3) rates for DoD lab technology through dual-use commercialization via early-stage ventures.

The NSIN's physical network is composed of 11 Regional Directors, each of which is located in critical venture innovation hubs throughout the country to include: Boston, MA; New York City, NY; Washington, DC; Orlando, FL; Chicago, IL; St. Louis, MO; Austin, TX; Denver, CO; Seattle, WA; San Diego, CA; and San Francisco, CA. They are supported by University Program Directors (UPDs) that are embedded at critical universities throughout the country and Spoke Directors (SDs) who focus on critical, smaller ecosystems within a larger Region. At the objective state, NSIN envisions approximately 55 such UPDs/SDs throughout the country and in all 50 states.

The NSIN executes a suite of 14 programs (e.g., Hacking for Defense, X-Force, Foundry) and multiple pilot activities (see below) with annual costs of approximately \$40.000 million, inclusive of the personnel that support program planning, execution, and assessment.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603950D8Z / <i>National Security Innovation Network</i>
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The NSIN has been a continuous Congressional interest program that has received funding in FY 2016 (\$5.000 million), FY 2017 (\$25.000 million), FY 2018 (\$25.500 million), FY 2019 (\$15.000 million), FY 2020 (\$40.000 million), and FY 2021 (\$40.000 million). In prior years, NSIN was predominantly funded through Congressional Additions but was included in the President's Budget submission for FY 2020 (\$25.000 million). FY 2022 is the first year that NSIN appears as a funded Program Element throughout the FYDP and its program mission was codified in Section 219 of the FY 2021 NDAA.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	38.532	21.270	0.000	-	0.000
Current President's Budget	38.532	36.203	22.028	-	22.028
Total Adjustments	0.000	14.933	22.028	-	22.028
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	15.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• FFRDC	-	-0.067	-	-	-
• Economic Assumption	-	-	0.758	-	0.758
• Adjustments to Budget Year	-	-	21.237	-	21.237
• Diversity, Equity, Inclusion, and Accessibility	-	-	0.033	-	0.033

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 845: *National Security Innovation Network*

Congressional Add: *NSIN*

	FY 2021	FY 2022
	38.532	15.000
Congressional Add Subtotals for Project: 845	38.532	15.000
Congressional Add Totals for all Projects	38.532	15.000

Change Summary Explanation

FY 2022 funding supports the Emerge (rebranded from National Security Academic Accelerator (NSA2)) program, expands H4D efforts, expands the Propel program, and pilots additional program concepts in partnership with the Office of Small Business Programs, ManTech, SBIR office, and offices of the Deputy Director of Research and Engineering for Modernization.

In FY 2022 Appropriation includes a \$15 million program increase.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> / BA 3: <i>Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603950D8Z / <i>National Security Innovation Network</i>	
FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.		

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603950D8Z / National Security Innovati on Network				Project (Number/Name) 845 / National Security Innovation Network			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
845: National Security Innovation Network	37.658	38.532	36.203	22.028	-	22.028	21.955	21.882	21.746	22.180	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

NSIN executes the following programs and pilot activities, all of which are designed to enhance DoD's access to technologists and entrepreneurs for the purposes of improving its talent pool, enable collaboration with universities and the early-stage venture community to develop novel concepts and solutions for end-user problems and requirements, and prototype and test new technologies to place them on the path to becoming programs of record or integrated with existing platforms.

- Technology and National Security Fellowship: a national, one-year fellowship pilot that places STEM graduates into the immediate offices of policymakers in Congress and the Pentagon for the purposes of enhancing technical literacy and improving policy outcomes through an informed understanding of emerging and nascent technologies.
- Hirethon: a national program that leverages NSIN's existing and emerging network to pair exceptionally qualified candidates with DoD mission partners that plan to use direct or expedited hiring authorities to aid in job placement.
- X-Force Fellowship: a summer fellowship experience for current students that embeds project-based teams of graduate and undergraduate students with DoD mission partners for the purposes of developing early-stage prototypes. Occurs annually from June-August.
- Experts: a national program that identifies mid-career faculty experts with STEM, cyber, or entrepreneurial backgrounds and pairs them with DoD leadership for periodic consultations over the course of three months.
- Tech Squad: a national pilot that provides remote, part-time, voluntary service opportunities that connect early-career STEM professionals with DoD units to solve tech-oriented national security problems collaboratively.
- Hacking for Defense: a course taught at universities around the country that pairs DoD end-users with top university students for collaborative problem-solving over the course of an academic semester. Students work to develop a minimum viable product solution to improve the real-world problems of service members that can be adopted by the DoD end-users.
- Hacks: a national program that provides early-stage concept development and proof of principle solutions to DoD mission partners through dedicated, virtual, multi-day hackathons operated in conjunction with top universities and start-ups throughout the country.
- Bootcamp: a national program that provides crowd-sourced solutions for DoD mission partners by deploying faculty from top-tier research universities to bases and installations to facilitate early-stage concepts for technology and policy-based problems.
- Maker: a national program that offers rapid prototyping for solutions drawn from accepted novel solution concepts from NSIN programming, allowing customers to turn ideas from the abstract and theoretical into practical and real prototypes.
- Source: a national program that provides a virtual platform of crowd-sourced ideas that DoD leaders can interact with in the form of online innovation challenges.
- Capstone: a national program that pairs prototyping development needs for DoD mission partners with extant engineering capstone courses from top-tier research universities throughout the country. Outputs include TRL-4 prototypes that can undergo testing and evaluation.
- Starts: a national program that showcases high-TRL technologies to DoD mission partners for the purposes of enhanced tech scouting and improving technical capability gaps. Teams and companies with the technology that best meets a DoD mission partner's needs are awarded initial prototyping or testing contracts.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603950D8Z / National Security Innovation Network	Project (Number/Name) 845 / National Security Innovation Network		
<ul style="list-style-type: none">• Vector: a national program that provides an accelerated learning opportunity based on the business fundamentals of dual-use venture creation. The program seeks prior NSIN programming alumni to participate for the opportunity to compete for a follow-on contract.• Propel: a national program that partners with commercial incubators and accelerators to sponsor particularly promising technology and early-stage ventures into cohort-based customer discovery that improves DoD end-user validation.• Foundry (rebranded from Defense Innovation Accelerator (DIA)): a national program that identifies breakthrough DoD lab technology and leverages it to solve the real-world problems of DoD and commercial customers. Teams of entrepreneurs, working with DoD lab scientists and technologists, assess the market viability and the potential to commercialize DoD lab technologies.• Emerge Accelerator (rebranded from National Security Academic Accelerator (NSA2)): a national pilot that identifies extant university IP, matches it against DoD mission partner needs, and then commercializes the technology through entrepreneurial training, recruitment, and licensing agreements. Currently being executed at four pilot sites with the intent to expand it to an additional six (6) sites in FY 2022.				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Title: National Security Innovation Network (NSIN)		-	21.203	22.028
Description: The NSIN mission is to build networks of innovators to generate new solutions for national security problems. It does this through three portfolios of programs and services designed to catalyze non-traditional problem-solving capabilities that combine warfighters, early-stage ventures, and applied academic communities at top-tier research universities.				
FY 2022 Plans: In addition to executing programs and pilots with its DoD mission partners, NSIN will: <ul style="list-style-type: none">• Establish 15 project sites for the Emerge (rebranded from National Security Academic Accelerator (NSA2)) program in as many states.• Expand H4D efforts with NATO and other partners and allies including India, Japan, Australia, and New Zealand. (Not possible at FY21 President’s Budget submission funding level.)• Expand the Propel program, which partners with commercial incubators and accelerators to sponsor early-stage dual-use ventures of DoD interest to up to 15 different sites throughout the United States.• Pilot additional program concepts in partnership with the Office of Small Business Programs, ManTech, SBIR office, and offices of the Deputy Director of Research and Engineering for Modernization.				
FY 2023 Plans: In addition to executing programs and pilots with its DoD mission partners, NSIN will: <ul style="list-style-type: none">• Establish 15 project sites for the Emerge (rebranded from National Security Academic Accelerator (NSA2)) program in as many states.• Expand H4D efforts with NATO and other partners and allies including India, Japan, Australia, and New Zealand. (Not possible at the submitted President’s Budget level.)• Expand the Propel program, which partners with commercial incubators and accelerators to sponsor early-stage dual-use ventures of DoD interest to up to 15 different sites throughout the United States.				

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603950D8Z / <i>National Security Innovation Network</i>	Project (Number/Name) 845 / <i>National Security Innovation Network</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> Pilot additional program concepts in partnership with the Office of Small Business Programs, ManTech, SBIR office and offices of the Deputy Director of Research and Engineering for Modernization, including efforts for Diversity, Equity, Inclusion, and Accessibility. 				
FY 2022 to FY 2023 Increase/Decrease Statement: There was no significant change between FY 2022 and FY 2023.				
Accomplishments/Planned Programs Subtotals		-	21.203	22.028
		FY 2021	FY 2022	
Congressional Add: NSIN FY 2021 Accomplishments: FY 2021 Accomplishments: In addition to executing programs and pilots with its DoD mission partners, NSIN accomplished the following in FY21: <ul style="list-style-type: none"> Expanded regional footprint with the addition of five Regional Directors and 11 University Program Directors (UPD) at Tier-1 and Tier-2 Research Institutions. This expansion included NSIN's first strategic partnership with a Historically Black College or University with the placement of a UPD at Florida A&M University. Launched Mission Acceleration Center pilot in partnership with the Department of the Navy in Seattle, WA. This pilot program provides a physical center of gravity in the Pacific Northwest for new, non-traditional problem solvers to engage with the DoD. Increased university engagement by 84% in FY21 relative to FY20. Increased new participants in national security innovation by 124% in FY21 relative to FY20 to 4,014. 63% of the new participants were drawn from historically underrepresented (based on gender, race, and ethnicity) populations. FY 2022 Plans: In addition to executing the FY2022 Plans listed above, with the Congressional Add of \$15m NSIN will: <ul style="list-style-type: none"> Continue supporting the Mission Acceleration Center pilot and expand program offerings. Establish rapid prototyping sites at new universities or accelerators to facilitate Maker projects. Develop a deeper regional presence in Kansas, Oklahoma, Alabama, Minnesota, and Utah to facilitate NSIN programming opportunities. Establish additional regional providers for the Bootcamp program, to keep up with the rapidly increasing demand signal from DoD Organizations. 		38.532	15.000	

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603950D8Z / <i>National Security Innovation Network</i>	Project (Number/Name) 845 / <i>National Security Innovation Network</i>

	FY 2021	FY 2022
<ul style="list-style-type: none"> Continue to expand Foundry (rebranded from the Defense Innovation Accelerator program) to other Government laboratories (E.G. DOE, NNSA, etc.), FFRDCs, and other sources of latent technology. 		
Congressional Adds Subtotals	38.532	15.000

C. Other Program Funding Summary (\$ in Millions)
 N/A

Remarks

D. Acquisition Strategy
 N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	PE 0604055D8Z I <i>Operational Energy Capability Improvement (OECI)</i>											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	62.686	15.413	108.482	180.170	-	180.170	170.703	175.181	177.330	186.051	-	-
455: <i>Operational Energy Capability Improvement</i>	62.686	15.413	108.482	180.170	0.000	180.170	170.703	175.181	177.330	186.051	-	-

Note

New Start (Y/N): N

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Build Sustainable and Long-Term Advantage, and Build a Resilient Joint Force Defense Ecosystem.

The Operational Energy Capability Improvement (OECI) program matures and demonstrates advanced technologies in operational energy across warfighting platforms and domains.

In FY 2023, OECI will continue, and complete projects started in FY 2022, and support Congressionally directed projects in the DoD Science and Technology Energy Strategy Focus in the following areas: 1) Powering the Force, 2) Electrifying the Battlespace, and 3) Commanding Energy. Competitively awarded projects will continue to focus on multi-year technology maturation efforts. In addition, focused Science and Technology (S&T) efforts will be initiated to specially address operational energy challenges faced by ground vehicles and aviation systems. All these investments address high priority joint operational energy requirements to ensure best-use of operational energy on the battlefield informed, when and where possible. Projects will increase the joint force's lethality and agility and reduce logistical burdens. These new capabilities are required to address threats from near peer enemies across the globe.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	16.000	74.300	0.000	-	0.000
Current President's Budget	15.413	108.482	180.170	-	180.170
Total Adjustments	-0.587	34.182	180.170	-	180.170
• Congressional General Reductions	-	-0.418			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	34.600			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.584	-			
• Adjustments to Budget Year	-	-	180.170	-	180.170
• Other Reprogramming	-0.003	-	-	-	-

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0604055D8Z I <i>Operational Energy Capability Improvement (OECI)</i>	

<p><u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u></p> <p>Project: 455: <i>Operational Energy Capability Improvement</i></p> <p style="padding-left: 40px;">Congressional Add: <i>Operational Energy Capability Improvement Program Increase</i></p> <p style="text-align: right; padding-right: 100px;">Congressional Add Subtotals for Project: 455</p> <p style="text-align: right; padding-right: 100px;">Congressional Add Totals for all Projects</p> <p><u>Change Summary Explanation</u></p> <p>FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.</p>	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="padding: 5px;">FY 2021</th> <th style="padding: 5px;">FY 2022</th> </tr> <tr> <td style="padding: 5px;">15.413</td> <td style="padding: 5px;">-</td> </tr> <tr> <td style="padding: 5px;">15.413</td> <td style="padding: 5px;">-</td> </tr> <tr> <td style="padding: 5px;">15.413</td> <td style="padding: 5px;">-</td> </tr> </table>	FY 2021	FY 2022	15.413	-	15.413	-	15.413	-
FY 2021	FY 2022								
15.413	-								
15.413	-								
15.413	-								

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0604055D8Z / Operational Energy Capability Improvement (OEI)				Project (Number/Name) 455 / Operational Energy Capability Improvement			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
455: Operational Energy Capability Improvement	62.686	15.413	108.482	180.170	0.000	180.170	170.703	175.181	177.330	186.051	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The mission of the OEI is to fund innovation that will improve DOD operational effectiveness via targeted S&T investments. As Defense-Wide funding, it incentivizes S&T to promote long term change in DOD capabilities, so they are better aligned with the Operational Energy Strategy. The OEI fosters innovation to improve operational energy performance and has two key mission aspects. First, to develop, demonstrate and transition into use operational energy technologies and practices that will improve DOD military capabilities and/or reduce costs. Second, to establish within the military Services sustainable, institutional capability to continue to research, develop and adopt operational energy innovations. The OEI funds serve as “seed money” to start or consolidate promising operational energy programs to be sustained by the Services; accordingly, the OEI generally emphasizes supporting or establishing programs, rather than one-off projects.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: Operational Energy Capability Improvement (OEI)									-	108.482	180.170	
FY 2022 Plans: Operational Energy Capability Improvement will develop and demonstrate the most promising, innovative, and cost-effective technologies and methods that address joint high priority operational energy requirements. OEI funding efforts will identify and mitigate energy-related risks and increase warfighting capabilities and resilience. OEI will invest in three focus areas: • Powering the Force: Support the deployment of mobile and distributed operations with resilient and agile energy logistics in contested environments. Reduce the risks, vulnerability, and climate impacts of DOD’s dependence on fuel. • Electrifying the Battlespace: Enable the electrification of weapons, platforms, unmanned systems, and soldiers to field new weapon, sensing, active defense, and other technologies. Meet the growing demands of power across the battlespace. • Commanding Energy: Capture and understand energy profiles to transform the Joint Force from reactive to predictive energy management and control. Achieve real-time energy awareness and command and control at all levels. Projects in the three priority areas include: Powering the Force Investment focus: • Integrate hybrid-electric platform power into standardized tactical micro-grids; ruggedize portable renewables and energy harvesting technology alongside distributed battery energy storage; decrease the detectable signature and value of fuel movers and storage.												

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0604055D8Z / Operational Energy Capability Improvement (OECI)		Project (Number/Name) 455 / Operational Energy Capability Improvement	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Benefits to the Department of these investments include more mobile and distributed operations with decreased logistics requirements and reduced the risk to personnel and equipment of carrying fuel into the fight, especially through contested environments.					
Electrifying the Battlespace Investment focus: <ul style="list-style-type: none"> • Improve ruggedized battery performance, to include standardization and safety; develop hybrid systems that include electrical propulsion; reduce the weight of personally carried batteries; improve the efficiency, reliability, and performance of wireless power beaming receivers and integrated systems. • Develop advance power and thermal management technologies to meet the growing demands of high-power systems. Benefits to the Department of these investments include further enabling the electrification of weapons, platforms, unmanned systems, soldiers, sensors, and other systems used by maneuver forces. This drastically reduces energy resupply risks, costs, and signatures to enable persistent unmanned systems and unattended sensors used for ISR.					
Commanding Energy Investment focus: <ul style="list-style-type: none"> • Integrate operational energy into mission planning, execution and modeling tools; war-gaming, and personnel development. Benefits to the Department of these investments include analytic products used by operational planners to develop better mission and campaign pre-position, force flow and battlespace distribution plans; and by field commanders to better understand the energy profile of enemy forces and conduct real-time contingency planning to enable the joint force to manage and control battlespace energy in a more predictive and less reactive mode. The tools can provide field commanders options in response to enemy action not otherwise available, enabling actions that might be less predictable by enemy forces.					
FY 2023 Plans: In FY 2023, OECI will continue, and complete projects started in FY 2022 and support new projects in DOD Science and Technology Energy Strategy Focus areas of 1) Powering the Force, 2) Electrifying the Battlespace, and 3) Commanding Energy. One third of the FY 2022 projects will continue their multi-year development. In addition, focused S&T efforts will be initiated to specially address operational energy challenges faced by ground vehicles and aviation systems. Technology development to support electrified/hybridized power architectures for existing crewed/uncrewed vehicles will be started and enhanced efficiency power/energy architectures for crewed/uncrewed air vehicles will be developed.					
FY 2022 to FY 2023 Increase/Decrease Statement: OECIF competitively awards joint service-nominated projects that best provide operational advantage to combat forces with an emphasis on 1) the deployment of more mobile and distributed operations systems, 2) reduced and more agile logistics, and 3) reduced risk especially within contested environments. The increase in FY 2023 funding is required to continue the baseline					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0604055D8Z / Operational Energy Capability Improvement (OECI)	Project (Number/Name) 455 / Operational Energy Capability Improvement		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
program (\$73.670) and initiate focused operational energy investments in ground vehicle issues (\$34.500) and aviation system issues (\$72.000).					
Accomplishments/Planned Programs Subtotals			-	108.482	180.170
			FY 2021	FY 2022	
Congressional Add: Operational Energy Capability Improvement Program Increase			15.413	-	
FY 2021 Accomplishments: Congressional Adds directed for nuclear fuel core development to support the PELE reactor maturation and also funding to support power and thermal management maturation for directed energy weapons.					
The Tri-structural Isotropic (TRISO) fuel line is a collaboration between DoD, NASA, and DOE. The first phase in the process is to establish the viability of a commercial TRISO fuel line that could be used by these agencies for any program, and to produce enough TRISO fuel to demonstrate throughput and quality control. The second phase is to purchase a nuclear reactor core for the PELE program. The Congressional Add for TRISO fuel production builds a nuclear fuel fabrication line, in support of DOD's Project Pele for modular nuclear reactors as well as supporting activities for NASA. This funding includes the purchasing of equipment, installation, and additional testing, which will lead to production of demonstration nuclear fuel beginning in FY 2022. Payoff will ensure a commercial TRISO fuel line is available for the PELE Nuclear Micro-Reactor to procure the nuclear reactor core when the Record of Decision for the program is complete.					
The Congressional Add for thermal and power technology develops thermal energy storage technologies that are more efficient, effective; and size, weight, and power superior. Demonstrations are planned for relevant (hundreds of kW magnitude) power levels, indicative of directed energy weapon engagement and load profiles. This work will demonstrate core technologies associated with the materials, interfaces, controls, and overall system integration, and then apply those lessons to larger scale prototypes that support laser scaling initiatives with higher lethality.					
Congressional Adds Subtotals			15.413	-	
C. Other Program Funding Summary (\$ in Millions)					
N/A					
Remarks					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0604055D8Z / Operational Energy Cap ability Improvement (OECI)	Project (Number/Name) 455 / Operational Energy Capability Improvement
D. Acquisition Strategy N/A		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I</i> BA 3: <i>Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0303367D8Z <i>I Spectrum Access Research and Development</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	53.247	11.096	0.000	-	-	-	-	0.000	-	-	-	-
011: <i>Spectrum Relocation Funds</i>	53.247	11.096	0.000	-	-	-	-	0.000	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Funding supports Pre-Auctioned Spectrum relocation and sharing activities.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	11.096	0.000	0.000	-	0.000
Current President's Budget	11.096	0.000	0.000	-	0.000
Total Adjustments	0.000	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			

Change Summary Explanation

Funds in the amount of \$11.096 million in FY 2021 transferred in from Office of Management and Budget for the support of the Spectrum Relocation Funds.

<u>C. Accomplishments/Planned Programs (\$ in Millions)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>
<i>Title:</i> Pre-Auction Spectrum Relocation Fund	11.096	-	-
<i>Description:</i> Funding supports Pre-Auctioned Spectrum relocation and sharing activities.			
Accomplishments/Planned Programs Subtotals	11.096	-	-

D. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)		R-1 Program Element (Number/Name) PE 0303367D8Z / Spectrum Access Research and Development
E. Acquisition Strategy N/A		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)	R-1 Program Element (Number/Name) PE 0909999D8Z / Financing for Cancelled Account Adjustments
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	5.805	0.903	0.000	0.000	-	0.000	0.000	0.000	-	-	Continuing	Continuing
000: Financing for Cancelled Account Adjustments	5.805	0.903	0.000	0.000	-	0.000	0.000	0.000	-	-	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Financing for cancelled accounts adjustments.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.903	0.000	0.000	-	0.000
Total Adjustments	0.903	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.903	-			
• SBIR/STTR Transfer	-	-			

Change Summary Explanation

Funds reprogrammed in support of cancelled accounts during the year of execution.

<u>C. Accomplishments/Planned Programs (\$ in Millions)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>
Title: Cancelled or Closed Account Adjustments	0.903	-	-
Description: This project funds closed and cancelled accounts. Reprogramming of current / execution year funding accommodates this account.			
Accomplishments/Planned Programs Subtotals	0.903	-	-

D. Other Program Funding Summary (\$ in Millions)

N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I</i> BA 3: <i>Advanced Technology Development (ATD)</i>		
R-1 Program Element (Number/Name) PE 0909999D8Z <i>I Financing for Cancelled Account Adjustments</i>		
D. Other Program Funding Summary (\$ in Millions)		
Remarks		
E. Acquisition Strategy N/A		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603161D8Z <i>I Nuclear and Conventional Physical Security National Technical Nuclear Forensics</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	338.353	31.634	28.525	41.507	-	41.507	37.552	28.333	27.578	25.967	-	-
162: <i>Nuclear and Conventional Physical Security</i>	289.045	24.492	21.155	31.955	-	31.955	28.771	28.333	27.578	25.967	-	-
040: <i>National Technical Nuclear Forensics Systems</i>	42.170	2.234	7.370	9.552	-	9.552	8.781	-	-	-	-	-
041: <i>CNT Prevention ADC&P</i>	7.138	4.908	-	-	-	-	-	-	-	-	-	-

Note

New Start (Y/N): No

Funding transferred from Countering Nuclear Threats (CNT) to National Technical Nuclear Forensics (NTNF), P040. In FY 2018, Departments and Agencies began to shift research and development from NTNF to other mission areas. This resulted in degradation of the Department of Defense (DoD) (and by default, the U.S. Government's (USG)) already limited ability to effectively and reliably execute the nuclear forensics mission. As the lead for providing the USG's post-detonation nuclear forensics capability, the DoD is emphasizing the importance of this mission in deterring adversaries and ensuring success of the USG's post-detonation NTNF mission.

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression, Defend the Homeland, Provide Nuclear Deterrence, and Build Sustainable and Long-Term Advantage.

Nuclear and Conventional Physical Security/National Technical Nuclear Forensics addresses the need to defend and deter against weapons of mass destruction threats and to safeguard personnel, prevent unauthorized access to equipment, installations, material, and documents, and to safeguard the foregoing against espionage, sabotage, damage, and theft. This program oversees advanced engineering development and rapid fielding throughout the DoD for an integrated and systemic approach for NTNF and the development of nuclear and conventional physical security material solutions. Public Law, Presidential, and DoD guidance, and Combatant Command and Service requirements drive the priorities for these programs.

Under this PE, funding associated with nuclear and conventional physical security materiel solutions for the Department are broken down into seven capability areas: (1) Detection and Assessment; (2) Access Controls; (3) Installation and Transport Security; (4) Storage and Safeguards; (5) Prevention; (6) Decision Support Systems; and (7) Analytical Support. The material solutions either (a) lead to a Program of Record transitioning to Program Element 0604161D8Z for Systems Development and Demonstration; (b) become technology insertions into existing programs; or (c) advance to being a certified Commercial/Government off-the-shelf product. The Physical Security Enterprise and Analysis Group is responsible for avoiding duplication of effort, ensuring systems integration, and promoting interoperability and sustainability.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603161D8Z I <i>Nuclear and Conventional Physical Security National Technical Nuclear Forensics</i>
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Per Presidential Policy Directive 42, Annex C, the DoD provides the USG post-detonation NTNF capability. Per DoD Directive 2060.04, the Office of the Undersecretary of Defense for Acquisition & Sustainment (OUSD(A&S)) is the office responsible for developing and leading the DoD's NTNF capabilities. Ensuring the USG can identify the source of nuclear material and hold those responsible for an attack is critical to our national defense and security. Internal and independent assessments indicate new capabilities are needed to sustain an effective deterrent against nuclear attack and meet the challenges of future threats. This PE is the only DoD Research, Development, Test, and Evaluation (RDT&E) program focused on Advanced Component Development and Prototypes for post-detonation NTNF capabilities and without fully supporting these requirements, the DoD's ability to meet this critical deterrence need will be significantly degraded.

This PE can fund travel to support the requirements of this program.

This appropriation will finance work, including staffing, performed by a government agency or by private individuals or organizations under a contractual or grant arrangement with the government who conduct research, development, and test and evaluation efforts.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	32.616	28.687	0.000	-	0.000
Current President's Budget	31.634	28.525	41.507	-	41.507
Total Adjustments	-0.982	-0.162	41.507	-	41.507
• Congressional General Reductions	-	-0.162			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.982	-			
• Adjustments to Budget Year	-	-	41.507	-	41.507

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603161D8Z / Nuclear and Conventional Physical Security National Technical Nuclear Forensics				Project (Number/Name) 162 / Nuclear and Conventional Physical Security			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
162: Nuclear and Conventional Physical Security	289.045	24.492	21.155	31.955	-	31.955	28.771	28.333	27.578	25.967	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Physical Security Enterprise & Analysis Program (PSEAP) conducts Technology and Engineering and Manufacturing Development throughout the Department of Defense for an integrated and systemic approach for nuclear and conventional physical security technology and systems. Priorities are driven by Combatant Command and Service requirements. This program is also addressing the Unmanned Systems threat by developing technology solutions that address the entire Kill Chain (Detect, Track, Identify, and Defeat) that are interoperable.

Funding associated with nuclear and convention physical security materiel solutions for the Department are broken down into seven capability areas: (1) Detection and Assessment; (2) Access Controls; (3) Installation and Transport Security; (4) Storage and Safeguards; (5) Prevention; (6) Decision Support Systems; and (7) Analytical Support. The material solutions either (a) lead to a Programs of Record transitioning to Program Element 0604161D8Z for Systems Development and Demonstration; (b) become technology insertions into existing programs; or (c) advance to being a certified Commercial/Government off-the-shelf product. The Physical Security Enterprise and Analysis Group (PSEAG) is responsible for avoiding duplication of effort, ensuring systems integration, and promoting interoperability and sustainability.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Detection and Assessment	13.092	12.592	21.515
<p>Description: The ability to detect an adversary and assess their intentions is a basic physical security tenant. This capability area will design equipment to identify and warn of unauthorized access to a specified area or installation as well as equipment related to the notification and identification of explosive threats or hazards.</p> <p>Accomplishment: The PSEAG and the National Nuclear Security Administration (NNSA) are jointly developing a Portable Intrusion Detection System (PIDS) that addresses similar needs to protect nuclear weapons and special nuclear material. PIDS will provide a stable sensor platform that maintains the integrity of an existing secure perimeter in the event of sensor maintenance or system downtime. These include, but are not limited to, scheduled maintenance and upgrade activities for extended periods of time, or during emergency situations requiring the establishment of a National Defense Area, and mission requirements that dictate deployment of nuclear certified assets to locations that do not meet nuclear security requirements.</p> <p>FY 2022 Plans:</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0603161D8Z / Nuclear and Conventional Physical Security National Technical Nuclear Forensics		Project (Number/Name) 162 / Nuclear and Conventional Physical Security	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> • Complete the development of a system that produces high-quality underwater images enabling human assessment of underwater threats at ranges up to 70 feet. • Complete the development of an algorithm to automatically classify alarms to quickly present valid alarms, reduce the occurrences of invalid alarms, and test in an operationally relevant waterside security environment. • Assess and demonstrate the application of small Unmanned Aerial System's use in performing Physical Security Assessment of intrusions in remote areas such as perimeters and enclaves that are protected by an Intrusion Detection System (IDS), but are not equipped with co-located physical security assessment (i.e. EO/IR) equipment. • Improve the AN/WQX-2 harbor security sonar's ability to detect Unmanned Underwater Vehicles by exploiting developments in the AN/WQX-2 sonar hardware refresh project. • Combine the unique capabilities Wide Area Surveillance & Detection System and pursue the integration of RADAR technology to provide operational capability in adverse weather conditions. • Develop Deep Learning Real Time Adaptive Learning Monitoring of Sound Velocity Profile to optimize a harbor security system's detection range capabilities. <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> • Survey the state of the art across industry and the DoD for capabilities to counter unmanned systems, specifically on the ground and at sea. Study kinetic and non-kinetic defeat mechanisms, existing prototypes and fielded systems and assess potential applicability as a force protection capability. • Enhance the efficacy of actionable object detection, tracking and identification data at the tactical edge by augmenting current artificial intelligence software with a geospatial cross referencing capability to generate pattern of life analysis and reduce the workload on the user. • Validate a recently developed, commercially available Trace (Explosives) Quality Control (TQC) Kit. The TQC will address sampling/training concerns following fielding of trace explosive detection system, which have existed for sometime in the community. • Assess the capabilities and limitations of gas chromatography mass spectrometry system, with particular focus on ease of use and detection of threats in complex matrices. • Integrate and test Long Range Day/Night Cameras and Visual Object Tracking; continuous pan, tilt, and zoom; motion detection and object classification; sensing capabilities; surface radar with maritime filtering; underwater fiber-optic sensor; for surface and subsurface detection and classification. • Develop methodology for Unmanned Underwater Vehicle (UUV) acoustic signature collection, develop passive recording range, and establish initial repository for storing and managing UUV signatures. <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603161D8Z / Nuclear and Conventional Physical Security National Technical Nuclear Forensics	Project (Number/Name) 162 / Nuclear and Conventional Physical Security		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
The FY 2022 to FY 2023 increase is the result of planned internal program adjustments based on Combatant Command and Military Services needs.				
Title: Access Controls Description: Controlling access to safeguard personnel and their families and to prevent unauthorized access to critical infrastructure and materials is paramount. This capability area focuses on programs and processes related to the validity and verification of individuals entering or already within a facility. Accomplishment: Defense Installation Access Control project enhances the Identity Matching Engine for Security & Analysis used at hundreds of DoD entry control points to compare Personal Identity Verification/Common Access Card holders against the National Crime Information Center and the Interstate Identification Index. Previous work developed a capability that compares DoD registered cardholders against the FBI's Wanted Persons File and against the Terrorist Screening Database. This capability prevents un-cleared people or potential terrorists from entering DoD installations. The upgraded system identified an individual with warrants for murder and aggravated assault with a deadly weapon attempting to gain installation access. FY 2022 Plans: <ul style="list-style-type: none"> Develop an effective and affordable Automated Installation Entry pre-enrolled express lane capability that can increase vehicle throughput and reduce security personnel without reducing access control point security. FY 2023 Plans: <ul style="list-style-type: none"> The Combatant Commands and the Services did not identify any material needs for this Budget Activity/Capability Area FY 2022 to FY 2023 Increase/Decrease Statement: FY 2022 to FY 2023 decrease is the result of an internal realignment of funds within the department for National Defense Strategy priorities.		4.792	2.745	0.000
Title: Installation and Transport Security Description: Robust installation and transport security are vital to preventing a weapon of mass destruction attack or the unauthorized access to key assets such as nuclear weapons and special nuclear material. This capability area focuses on programs and equipment intended to improve the physical security profile of fixed sites and facilities, as well as critical items while in-transit. Accomplishment: Joint Active Shooter Protection and Response project integrates sensors to automatically detect indoor gunshots; provides potential victims, responders, and authorized personnel with information to enhance situational awareness;		0.354	0.488	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603161D8Z / <i>Nuclear and Conventional Physical Security National Technical Nuclear Forensics</i>	Project (Number/Name) 162 / <i>Nuclear and Conventional Physical Security</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
and enable automatic or manual control of the building - inhibiting the shooter - shortening the duration of an active shooter incident.				
FY 2022 Plans: • Complete the evaluation of an Automated Unmanned Ground Vehicle for Patrol & Security to enhance and augment manned security resources by providing pre-positioned and roving outdoor surveillance, security, safety, and routine/repeatable.				
FY 2023 Plans: • The Combatant Commands and the Services did not identify any material needs for this Budget Activity/Capability Area				
FY 2022 to FY 2023 Increase/Decrease Statement: FY 2022 to FY 2023 decrease is the result of an internal realignment of funds within the department for National Defense Strategy priorities and Combatant Command and Military Services needs.				
Title: Storage and Safeguards Description: Properly securing critical assets to prevent access by unauthorized persons and implementing control measures that ensure access is limited to authorized persons is the foundation of physical security. This capability area focuses on equipment (e.g., locks, doors, etc.) designed to delay or stop unauthorized entry/access to a specified/localized area. Accomplishment: Develop a security container for aircraft use meeting customer-established metrics for system mass, dimension configuration, and environmental suitability. Integrate into a designated space on aircraft. Incorporate design features to meet customer-derived Concept of Operations and mission assurance metrics. Integrate design into existing aircraft configuration management and systems engineering concepts.		0.500	0.000	0.000
FY 2022 Plans: • The Combatant Commands and the Services did not identify any material needs for this Budget Activity/Capability Area				
FY 2023 Plans: • The Combatant Commands and the Services did not identify any material needs for this Budget Activity/Capability Area				
FY 2022 to FY 2023 Increase/Decrease Statement: No change				
Title: Prevention		2.385	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603161D8Z / Nuclear and Conventional Physical Security National Technical Nuclear Forensics	Project (Number/Name) 162 / Nuclear and Conventional Physical Security	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>Description: The security procedures taken to discourage an adversary from accessing weapons of mass destruction or gaining unauthorized access to critical assets are at the heart of prevention. This capability area focuses on broad spectrum, generic efforts which have the ability to influence multiple areas.</p> <p>Accomplishment: Increase Counter-Unmanned Aircraft System (C-UAS) capabilities and operator effectiveness at strategic locations within the DoD by integrating radar, electronic warfare, and camera sensor turret systems into common C2; installing physical passive defense barriers at critical locations; and expanding radar capabilities.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> • The Combatant Commands and the Services did not identify any material needs for this Budget Activity/Capability Area <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> • The Combatant Commands and the Services did not identify any material needs for this Budget Activity/Capability Area <p>FY 2022 to FY 2023 Increase/Decrease Statement: No change</p>			
<p>Title: Decision Support Systems</p> <p>Description: Decision support systems serve the management, operations, and planning levels of the DoD physical security enterprise to help to make decisions, which may be rapidly changing and not easily specified in advance. This capability area focuses on command and control equipment, projects related to the creation and enhancement of common operating pictures, and the establishment of common architectures / interface standards.</p> <p>Accomplishment: Platform for Integrated Command, Control, and Communication and Responsive Defense is a next generation security system using an open fusion annunciator, a secure cloud infrastructure and integration with a mobile Common Operating Picture, to create a cost-effective sensor platform. This capability will eventually replace antiquated security systems that are based on high cost sensor technology with low-cost sensors used in fields like the automotive industry.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> • Completed the development of a capability to allow a user to see color images at night by leveraging an electro-optical camera that is more cost effective than the commonly used infrared cameras. • Developed, tested and evaluated an Electronic Security Systems Information Management System to track physical security. • Developed a mobile interface providing real-time situational awareness to blue force personnel by using a two way communication device which is fixed to blue force's arm or vehicle mount. 		2.721	4.773
			10.440

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603161D8Z / <i>Nuclear and Conventional Physical Security National Technical Nuclear Forensics</i>	Project (Number/Name) 162 / <i>Nuclear and Conventional Physical Security</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> Conducted formal testing of COTS Ground-Based Threat Detection Radar software that claims to provide filters and algorithms to reduce nuisance and false alarm rates in maritime application environments. <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> Provide 24/7 "Digital Overwatch" for facilities and installations by identifying anomalies and threats in the RF and cyberspace realms that present imminent impacts to the base personnel, property, or systems. Integrate Portable Intrusion Detection System with modern backbone architecture to reduce operational and cyber security risk through secure cloud platform; improve with modern platform; and empower users with timely relevant information via mobile common operations picture. Expand perimeter security and emergency response to integrate full spectrum of operations to reduce operator workload by integrating into a console. Develop a mobile interface providing real-time situational awareness to blue force personnel. Customizable, scalable, two way communication device which is fixed to blue force's arm or vehicle mount. <p>FY 2022 to FY 2023 Increase/Decrease Statement: The FY 2022 to FY 2023 increase is the result of an internal realignment of funds within the department for National Defense Strategy priorities and Combatant Command and Military Services needs.</p>				
<p>Title: Analytical Support</p> <p>Description: This capability area will focus on studies related to physical security topics and operational and management efforts related to day-to-day activities of the DoD Physical Security/Countering Nuclear Threats RDT&E Program.</p> <p>Accomplishment: The Maritime Expeditionary & Transit Security project demonstrated and evaluated how advanced non-lethal weapons technology employed for extended range will enhance and improve response capabilities for the transit protection mission. This project also determined how a flexible and scalable precision fire weapons system capability enhances/augments the current use of crew served weapons to counter fast approaching surface threats during High Value Unit transits.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> Completed Next Generation Electronic Security System project to identify new sensor technology for use in future security systems. Leverage industry (e.g. automotive and autonomous operations) to identify low cost solutions. <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> The Combatant Commands and the Services did not identify any material needs for this Budget Activity/Capability Area <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>		0.648	0.557	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603161D8Z / <i>Nuclear and Conventional Physical Security National Technical Nuclear Forensics</i>	Project (Number/Name) 162 / <i>Nuclear and Conventional Physical Security</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			
The FY 2022 to FY 2023 decrease is the result of an internal realignment of funds within the department for National Defense Strategy priorities and Combatant Command and Military Services needs.		FY 2021	FY 2022
		24.492	21.155
Accomplishments/Planned Programs Subtotals		24.492	21.155
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603161D8Z / Nuclear and Convention al Physical Security National Technical Nucl ear Forensics					Project (Number/Name) 162 / Nuclear and Conventional Physical Security				
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Years - Closed Out Efforts	Various	Various : Various	201.433	-		-		-		-		-	-	-	-
Tactical Security System	MIPR	Multiple Performers : Multiple Locations	5.495	-		-		-		-		-	-	-	-
Portable Intrusion Detection System	MIPR	AFLCMC : Hanscom AFB, MA	4.962	-		-		-		-		-	-	-	-
Physical Security Enterprise & Analysis Program	Various	Multiple Performers : Multiple Locations	10.192	0.267		2.651		30.682		-		30.682	Continuing	Continuing	-
Virtual Reality Synthetic Boat and Warning Shot Simulator	MIPR	Multiple Performers : Multiple Locations	0.970	-		-		-		-		-	-	-	-
Secure Tactical Communications Module	MIPR	Multiple Performers : Multiple Locations	1.624	-		-		-		-		-	-	-	-
Flexible Fire Control System	MIPR	Multiple Performers : Multiple Locations	2.334	-		-		-		-		-	-	-	-
Alert Attack Resistant Container	MIPR	Naval Facilities Engineering and Expeditionary Warfare Center : Port Hueneme, CA	1.619	-		-		-		-		-	-	-	-
Stabilized Crew-Served Heavy Machine Gun Mount	MIPR	NSWC : Crane, IN	0.614	-		-		-		-		-	-	-	-
Joint Expeditious Surface-Threat Sonar Capability	MIPR	TBD : TBD	1.499	2.406		-		-		-		-	-	-	-
Counter UAS Capability for DoD	MIPR	Various Performers : Various Locations	4.868	5.338		-		-		-		-	-	-	-
Wide Area Surveillance & Detection System with Light Detection and Ranging	MIPR	TBD : TBD	2.000	1.000		-		-		-		-	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603161D8Z / Nuclear and Convention al Physical Security National Technical Nucl ear Forensics				Project (Number/Name) 162 / Nuclear and Conventional Physical Security					
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Mobile Underwater Threat Imaging System	MIPR	TBD : TBD	0.860	0.610		-		-		-		-	-	-	-
Real-Time Video Enhancement Software	MIPR	TBD : TBD	1.200	1.300		-		-		-		-	-	-	-
Affordable Counter Small UAS Situational Awareness	MIPR	TBD : TBD	1.600	1.400		-		-		-		-	-	-	-
Handheld Force Protection Command and Control	MIPR	TBD : TBD	0.900	1.200		-		-		-		-	-	-	-
Light Detection and Ranging Change and Shape Detection	MIPR	TBD : TBD	1.500	1.300		-		-		-		-	-	-	-
Automated Unmanned Ground Vehicle for Patrol & Security	MIPR	TBD : TBD	0.600	0.600		-		-		-		-	-	-	-
Effective/Affordable Night Time Color Camera	MIPR	TBD : TBD	1.500	1.300		-		-		-		-	-	-	-
Marine Mammal Program/ Cooperative Vigilance	MIPR	TBD : TBD	0.747	0.695		-		-		-		-	-	-	-
Integrated Multi-Sensor Perimeter Awareness with Intelligent Light Detection and Ranging System of Systems	MIPR	TBD : TBD	0.850	0.750		-		-		-		-	-	-	-
Near-Shore Unified Tactical Response (NUTR) Battlefield Objective Navigation Display (BOND)	MIPR	TBD : TBD	0.300	0.300		-		-		-		-	-	-	-
Security Controlled Unmanned Aerial Airfield System	MIPR	TBD : TBD	0.840	0.814		-		-		-		-	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603161D8Z / <i>Nuclear and Conventional Physical Security National Technical Nuclear Forensics</i>						Project (Number/Name) 162 / <i>Nuclear and Conventional Physical Security</i>			
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Automated Installation Entry Multiple Authentication Fast Lanes	MIPR	TBD : TBD	-	-		2.027		-		-		-	Continuing	Continuing	-
Deep Learning Real Time Adaptive Learning Monitoring of Sound Velocity Profile	MIPR	TBD : TBD	-	-		1.530		-		-		-	Continuing	Continuing	-
Development, Test and Evaluation of an Electronic Security Systems Information Management System	MIPR	TBD : TBD	-	-		1.444		-		-		-	Continuing	Continuing	-
Electronic Harbor Security System–Sensor Track Fusion	MIPR	TBD : TBD	-	-		0.854		-		-		-	Continuing	Continuing	-
Enterprise Ready Tactical Assault Kit	MIPR	TBD : TBD	-	-		2.750		-		-		-	Continuing	Continuing	-
Improved UUV Detection and Tracking Using the AN/WQX-2 Sonar	MIPR	TBD : TBD	-	-		1.950		-		-		-	Continuing	Continuing	-
Next Generation Electronic Security System	MIPR	TBD : TBD	-	-		1.200		-		-		-	Continuing	Continuing	-
Self Homing and Event Triggered / Assessment DroneAerial PS Assessment	MIPR	TBD : TBD	-	-		1.275		-		-		-	Continuing	Continuing	-
Wide Area Surveillance & Detection System with Radar	MIPR	TBD : TBD	-	-		1.386		-		-		-	Continuing	Continuing	-
Sonar Navigated Autonomous Grabber	MIPR	TBD : TBD	-	-		1.546		-		-		-	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603161D8Z / Nuclear and Convention al Physical Security National Technical Nucl ear Forensics					Project (Number/Name) 162 / Nuclear and Conventional Physical Security				
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Automated Neural Classification of Seismic and Acoustic Sensors	MIPR	TBD : TBD	-	-		1.337		-		-		-	Continuing	Continuing	-
Subtotal			248.507	19.280		19.950		30.682		-		30.682	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Years Completed Efforts	Various	Various Performers : Various Locations	5.436	-		-		-		-		-	-	-	-
Nuclear Security Subject Matter Experts	MIPR	Applied Research Laboratories, The University of Texas : Austin, Texas	1.595	0.225		-		-		-		-	-	-	-
Nuclear Matters Analytical Cell for Nuclear Deterrence	IA	DOE/Sandia National Laboratory : Albuquerque, NM	7.200	-		-		-		-		-	-	-	-
Nuclear Matters SIRC/ NDERG Support	Option/ T&M	SAIC : McLean, VA	2.366	-		-		-		-		-	-	-	-
Nuclear Matters Technical Support	IA	Department of Health and Human Services : Bethesda, MD	3.133	-		-		-		-		-	-	-	-
PSEAG Support	MIPR	Air Force Civil Engineer Center : Tyndall AFB, FL	0.575	0.575		-		1.100		-		1.100	-	-	-
Nuclear Matters/PSEAG Support	MIPR	TBD : TBD	-	1.762		-		-		-		-	-	-	-
DoD Electronic Security System Analysis	MIPR	Office of Naval Research : TBD	0.450	-		-		-		-		-	-	-	-
PSEAG Interoperability	MIPR	TBD : TBD	-	-		0.455		-		-		-	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0603161D8Z / Nuclear and Convention al Physical Security National Technical Nucl ear Forensics				Project (Number/Name) 162 / Nuclear and Conventional Physical Security							
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			20.755	2.562		0.455		1.100		-		1.100	Continuing	Continuing	N/A
Remarks NA															
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Years Completed Efforts	Various	Multiple Performers : Multiple Locations	10.687	-		-		-		-		-	Continuing	Continuing	-
Test & Evaluation Oversight	MIPR	SPAWARSYSCEN Atlantic : Charleston, SC	0.125	0.125		-		0.173		-		0.173	Continuing	Continuing	-
Counter Intrusion / Counter Unmanned Aircraft System	MIPR	Defense Technical Information Center - Various Performers : Various Locations	0.500	0.500		-		-		-		-	Continuing	Continuing	-
Development, Test and Evaluation of an Electronic Security Systems Information Management System	MIPR	TBD : TBD	0.690	0.750		-		-		-		-	Continuing	Continuing	-
Electronic Harbor Security System-Sensor Track Fusion	MIPR	Applied Research Laboratory/University of Texas (Through NAVSEA) : Austin, TX	0.750	0.300		-		-		-		-	Continuing	Continuing	-
Next Generation Electronic Security System	MIPR	NIWC-LANT : Charleston, SC	-	0.700		-		-		-		-	Continuing	Continuing	-
Test & Evaluation of Maritime Application Environment Radar	MIPR	TBD : TBD	-	-		0.750		-		-		-	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603161D8Z I Nuclear and Convention al Physical Security National Technical Nucl ear Forensics						Project (Number/Name) 162 I Nuclear and Conventional Physical Security			
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			12.752	2.375		0.750		0.173		-		0.173	Continuing	Continuing	N/A
Remarks NA															
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Years - Completed Efforts	Various	Multiple Performers : Multiple Locations	6.567	-		-		-		-		-	Continuing	Continuing	-
Management Services	TBD	Multiple Performers : Multiple Locations	0.464	0.275		-		-		-		-	Continuing	Continuing	-
Subtotal			7.031	0.275		-		-		-		-	Continuing	Continuing	N/A
Remarks NA															
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			289.045	24.492		21.155		31.955		-		31.955	Continuing	Continuing	N/A
Remarks NA															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603161D8Z / Nuclear and Conventional Physical Security National Technical Nuclear Forensics	Project (Number/Name) 162 / Nuclear and Conventional Physical Security



PSEAG REQUIREMENTS PROCESS





Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603161D8Z / <i>Nuclear and Conventional Physical Security National Technical Nuclear Forensics</i>	Project (Number/Name) 162 / <i>Nuclear and Conventional Physical Security</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Nuclear and conventional physical security R&D</i>				
Access Control	1	2023	4	2027
Analytical Support	1	2023	4	2027
Decision Support	1	2023	4	2027
Detection and Assessment	1	2023	4	2027
Installation & Transport Security	1	2023	3	2027
Prevention	1	2023	4	2027
Storage & Safeguards	1	2023	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603161D8Z / Nuclear and Conventional Physical Security National Technical Nuclear Forensics				Project (Number/Name) 040 / National Technical Nuclear Forensics Systems			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
040: National Technical Nuclear Forensics Systems	42.170	2.234	7.370	9.552	-	9.552	8.781	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Funding transferred from CNT to NTNF, P040. In FY 2018, Departments and Agencies began to shift research and development from NTNF to other mission areas. This resulted in degradation of the DoD (and by default, the U.S. Government's) ability to execute the nuclear forensics mission and deter adversaries. As the lead for providing the USG's post-detonation nuclear forensics capability, DoD is emphasizing the importance of this mission to ensure success.

Prior Year, FY 2020, and FY 2021 funding includes the funding associated with the CNT program.

A. Mission Description and Budget Item Justification

Per Presidential Policy Directive 42, Annex C, the DoD provides the USG post-detonation NTNF capability. Per DoDD 2060.04, OUSD(A&S) is the DoD office responsible for DoD's NTNF capabilities. This program is the only DoD RDT&E program focused on Advanced Component Development & Prototypes for NTNF capabilities.

Ensuring the USG can identify the source of nuclear material and hold those involved or supporting an attack accountable is critical to our national defense and security. Swift and accurate forensic and attribution (identification) capabilities are vital to supporting the President and Secretary of Defense in developing an appropriate, and timely, national response to a nuclear event and to prevent future attacks. An effective attribution capability ensures potential adversaries know that they will be held accountable if they use proxies or other non-traditional delivery of nuclear weapons against the U.S., U.S. interests, or allies. Both internal and independent studies indicate that continued improvement to the USG's NTNF capabilities is needed to sustain a credible deterrent against an attempted or actual nuclear attack.

Additionally, this program sustains perishable U.S. technical expertise at the operational DoD laboratories required to respond to a post-detonation NTNF event. DoD's laboratory capability in this area is limited by capacity and technical expertise. In FY 2018, Departments and Agencies began to shift research and development from NTNF to other mission areas, which resulted in degradation of the DoD's (and by default, the USG's) ability to execute the nuclear forensics mission and deter adversaries through the attrition of technical experts vital to the response. Sustained support of the DoD's NTNF mission is crucial to not only preventing attrition of current capabilities and knowledge base, but in ensuring that this critical and unique deterrence capability is not lost, putting the security of the nation and the ability to deter specific kinds of nuclear attack at risk.

This PE can fund travel to support the requirements of this program.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603161D8Z / <i>Nuclear and Conventional Physical Security National Technical Nuclear Forensics</i>	Project (Number/Name) 040 / <i>National Technical Nuclear Forensics Systems</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Title: NTNF Capability Development Description: The development of capability to identify the source of nuclear material from radioactive debris is critical to our national defense and security. Swift and accurate forensic and attribution (identification) capabilities are vital to supporting the President and Secretary of Defense in developing an appropriate national response to a nuclear event and to prevent future attacks in a timely manner. NTNF investments support development and retention of technical nuclear forensics expertise, improve the fixed laboratory process, improving legacy NTNF capabilities, and supporting operationalization of new capabilities. FY 2022 Plans: - Developed and transitioned technologies to address prompt detection gaps. - Advanced DoD NTNF laboratory and collection capabilities to shorten timelines and improve confidence levels in reporting to national level decision makers. - Addressed lessons learned from the first Post-Detonation NTNF Pathfinder exercise and findings identified by the National Academy of Sciences. - Educated Military & Federal workforce in areas critical to the Stockpile Stewardship Program and to increase understanding of the history of nuclear weapons development, testing, and design. FY 2023 Plans: - Further develop and transition technologies to address prompt detection gaps, including the United States Prompt Diagnostics System. - Continue to advance DoD NTNF laboratory and collection capabilities to shorten timelines and improve confidence levels in reporting to national level decision makers. - Educate Military & Federal workforce in areas critical to the Stockpile Stewardship Program and to increase understanding of the history of nuclear weapons development, testing, and design. FY 2022 to FY 2023 Increase/Decrease Statement: FY 2022 to FY 2023 increase in funding is associated with the elimination of the CNT program and the transition of funding from CNT to NTNF to address this critical need.		2.234	7.370	9.552
Accomplishments/Planned Programs Subtotals		2.234	7.370	9.552
C. Other Program Funding Summary (\$ in Millions)				
N/A				

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603161D8Z / <i>Nuclear and Conventional Physical Security National Technical Nuclear Forensics</i>	Project (Number/Name) 040 / <i>National Technical Nuclear Forensics Systems</i>
C. Other Program Funding Summary (\$ in Millions)		
Remarks		
D. Acquisition Strategy		
N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603161D8Z / Nuclear and Convention al Physical Security National Technical Nucl ear Forensics						Project (Number/Name) 040 / National Technical Nuclear Forensics Systems			
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
National Nuclear Technical Forensics Product Development	Various	Multiple Performers : Multiple Locations	38.681	0.509		7.175		9.357		-		9.357	Continuing	Continuing	-
AFTAC Projects	MIPR	Air Force Technical Applications Center : Patrick AFB, Florida	2.464	1.530		-		-		-		-	-	-	-
Subtotal			41.145	2.039		7.175		9.357		-		9.357	Continuing	Continuing	N/A
Remarks NA															
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
National Nuclear Technical Forensics Management Services- Prior Years	Various	Multiple Performers : Multiple Locations	0.093	-		-		-		-		-	Continuing	Continuing	-
Nuclear Testing, Diagnostics, Forensics and Stockpile Stewardship Course	IA	DOE : Livermore, CA	0.932	0.195		0.195		0.195		-		0.195	Continuing	Continuing	-
Subtotal			1.025	0.195		0.195		0.195		-		0.195	Continuing	Continuing	N/A
Remarks NA															
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			42.170	2.234		7.370		9.552		-		9.552	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense							Date: April 2022			
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0603161D8Z / Nuclear and Conventional Physical Security National Technical Nuclear Forensics			Project (Number/Name) 040 / National Technical Nuclear Forensics Systems			
	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract	
Remarks NA										

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense										Date: April 2022									
Appropriation/Budget Activity					R-1 Program Element (Number/Name)					Project (Number/Name)									
0400 / 4					PE 0603161D8Z / Nuclear and Convention					040 / National Technical Nuclear Forensics									
					al Physical Security National Technical Nucl					Systems									
					ear Forensics														

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
National Technical Nuclear Forensics																												
National Technical Nuclear Forensics																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603161D8Z / Nuclear and Conventional Physical Security National Technical Nuclear Forensics	Project (Number/Name) 040 / National Technical Nuclear Forensics Systems	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
National Technical Nuclear Forensics				
National Technical Nuclear Forensics	1	2023	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603161D8Z / <i>Nuclear and Conventional Physical Security National Technical Nuclear Forensics</i>				Project (Number/Name) 041 / <i>CNT Prevention ADC&P</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
041: <i>CNT Prevention ADC&P</i>	7.138	4.908	-	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
Funding transferred from Countering Nuclear Threats to National Technical Nuclear Forensics, P040. This decision affects Program Elements 0603161D8Z and 0604161D8Z by eliminating the CNT program.

A. Mission Description and Budget Item Justification
Funding transferred from Countering Nuclear Threats to National Technical Nuclear Forensics, P040. This decision affects Program Elements 0603161D8Z and 0604161D8Z by eliminating the CNT program.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Title: Countering Nuclear Threats	4.908	-	-
Description: Funding transferred from Countering Nuclear Threats to National Technical Nuclear Forensics, P040. This decision affects Program Elements 0603161D8Z and 0604161D8Z by eliminating the CNT program.			
Accomplishments/Planned Programs Subtotals	4.908	-	-

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603161D8Z / Nuclear and Convention al Physical Security National Technical Nucl ear Forensics	Project (Number/Name) 041 / CNT Prevention ADC&P

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Countering Nuclear Threats	Various	Various Performers : Various Locations	7.138	4.908		-		-		-		-	Continuing	Continuing	-
Subtotal			7.138	4.908		-		-		-		-	Continuing	Continuing	N/A

Remarks

Funding transferred from Countering Nuclear Threats to National Technical Nuclear Forensics, P040. This decision affects Program Elements 0603161D8Z and 0604161D8Z by eliminating the CNT program.

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	7.138	4.908		-		-		-		-	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense										Date: April 2022									
Appropriation/Budget Activity					R-1 Program Element (Number/Name)					Project (Number/Name)									
0400 / 4					PE 0603161D8Z / Nuclear and Conventional Physical Security National Technical Nuclear Forensics					041 / CNT Prevention ADC&P									

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Countering Nuclear Threats																												
Countering Nuclear Threats																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603161D8Z / Nuclear and Conventional Physical Security National Technical Nuclear Forensics	Project (Number/Name) 041 / CNT Prevention ADC&P	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Countering Nuclear Threats				
Countering Nuclear Threats	1	2023	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603600D8Z / WALKOFF
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	90.404	98.841	108.652	133.795	-	133.795	140.485	135.487	137.538	126.917	Continuing	Continuing
600: WALKOFF	90.404	98.841	108.652	133.795	-	133.795	140.485	135.487	137.538	126.917	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression, Defend the Homeland, and Build Sustainable and Long-Term Advantage.

Classified

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	101.529	108.652	0.000	-	0.000
Current President's Budget	98.841	108.652	133.795	-	133.795
Total Adjustments	-2.688	0.000	133.795	-	133.795
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.688	-			
• Adjustment to Budget Year	-	-	133.795	-	133.795

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603600D8Z / WALKOFF				Project (Number/Name) 600 / WALKOFF			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
600: WALKOFF	90.404	98.841	108.652	133.795	-	133.795	140.485	135.487	137.538	126.917	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Classified.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: WALKOFF	98.841	108.652	133.795
Description: Classified.			
FY 2022 Plans: Classified			
FY 2023 Plans: Classified			
FY 2022 to FY 2023 Increase/Decrease Statement: Classified.			
Accomplishments/Planned Programs Subtotals	98.841	108.652	133.795

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• 0603600D8Z O&M DW: WALKOFF	4.231	4.167	4.509	-	4.509	4.846	5.168	5.274	5.380	Continuing	Continuing

Remarks

D. Acquisition Strategy

Classified.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603600D8Z / WALKOFF	Project (Number/Name) 600 / WALKOFF
Remarks Classified.		

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense																Date: April 2022			
Appropriation/Budget Activity								R-1 Program Element (Number/Name)								Project (Number/Name)			
0400 / 4								PE 0603600D8Z / WALKOFF								600 / WALKOFF			

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Classified																												
Classified																												

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Classified																												
Classified																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603600D8Z / WALKOFF	Project (Number/Name) 600 / WALKOFF	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Classified				
Classified	1	2014	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603851D8Z I <i>Environmental Security Technology Certification Program (ESTCP)</i>
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COST (\$ in Millions)	Prior Years ⁽⁺⁾	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	526.260	72.135	122.737	84.638	-	84.638	113.690	143.793	160.969	161.433	-	-
514: <i>Environmental Security Technology Certification Program</i>	520.260	72.135	122.737	84.638	-	84.638	113.690	143.793	160.969	161.433	-	-

⁽⁺⁾ The sum of all Prior Years is \$6.000 million less than the represented total due to several projects ending

Note

New Start (Y/N): Partial - The Sustainable Technologies and Demonstration Program \$3.000; Climate Resilience Technology Demonstration/Validation Program \$13.094

STED is a new start. It was added by Congress the last three years but is in the request this year. The work characterized as Climate Resilience Technology Dem/Val is an increase to existing work that was categorized as Environment previously. This work is scheduled to increase as efforts to support the Administration's priorities ramp up so we thought it best to call this out as a separate sub-effort to better communicate the distribution of funds.

A. Mission Description and Budget Item Justification

This program supports the Department's initiative Building Sustainable and Long-Term Advantage.

The Environmental Security Technology Certification Program (ESTCP) demonstrates and validates promising and innovative environmental, resilience, and energy technologies that target the most urgent needs of the Department of Defense (DoD). Technologies selected are projected to provide a return on the investment through cost savings and improved efficiencies. The program responds to: (1) Congressional concern over the slow pace of remediation of environmentally polluted sites on military installations, (2) Congressional direction to conduct demonstrations specifically focused on emerging new technologies, and (3) the need to improve defense readiness by reducing the drain on the Department's operation and maintenance dollars caused by environmental restoration, waste management, and the cost of energy. Preference for demonstrations is given to technologies that have successfully completed all necessary research and development objectives, and address the highest priority DoD requirements.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603851D8Z / Environmental Security Technology Certification Program (ESTCP)
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B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	73.307	71.429	0.000	-	0.000
Current President's Budget	72.135	122.737	84.638	-	84.638
Total Adjustments	-1.172	51.308	84.638	-	84.638
• Congressional General Reductions	-	-0.402			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	51.710			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.172	-			
• Adjustments to Budget Year	-	-	84.638	-	84.638

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603851D8Z / Environmental Security Technology Certification Program (ESTCP)				Project (Number/Name) 514 / Environmental Security Technology Certification Program			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
514: Environmental Security Technology Certification Program	520.260	72.135	122.737	84.638	-	84.638	113.690	143.793	160.969	161.433	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Environmental Security Technology Certification Program (ESTCP) demonstrates and validates promising and innovative environmental and energy technologies that target the DoD's most urgent needs. Technologies selected are projected to provide a return on the investment through cost savings and improved efficiencies. The program responds to: (1) Congressional concern over the slow pace of remediation of environmentally polluted sites on military installations, (2) Congressional direction to conduct demonstrations specifically focused on emerging new technologies, and (3) the need to improve defense readiness by reducing the drain on the Department's operation and maintenance dollars caused by environmental restoration, waste management, and the cost of energy. Preference for demonstrations is given to technologies that have successfully completed all necessary research and development objectives, and address the highest priority the DoD requirements.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Environmental Technology Demonstration/Validation	45.988	80.561	30.277
<p>Description: Funds are programmed for investments in projects that address priority the DoD environmental requirements. The focus of the program is on live site unexploded ordnance (UXO) in the underwater environment, addressing emerging and recalcitrant cleanup issues, range sustainment technologies, and reducing life cycle costs of the DoD weapon systems by eliminating hazardous materials. Accomplishments/plans are described for each FY below.</p> <p>FY 2022 Plans: Completion of data collection to support development of a new Military Specification (MILSPEC) for shore-side fire extinguishment foams for the DoD use. Completion of technology demonstration to clean firefighting trucks and hangar systems in anticipation of the change-over to polyfluoroalkyl substances (PFAS)-free foams as required by the National Defense Authorization Act for FY 2020. Completion of projects to examine the impact of multiple stressors to marine mammals. Initiation of climate model comparisons to guide installation staff choices and development and demonstration of tools for Threatened and Endangered Species (TES) monitoring to improve training land utilization. Initiate large-scale demonstrations of PFAS destruction technologies in accordance with Congressional direction.</p> <p>FY 2023 Plans: Continued demonstration of firefighting performance of new PFAS-free Aqueous Film Forming Foam (AFFF) alternatives as they emerge from the Strategic Environmental Research and Development Program (SERDP) and/or are introduced by industry.</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603851D8Z / <i>Environmental Security Technology Certification Program (ESTCP)</i>	Project (Number/Name) 514 / <i>Environmental Security Technology Certification Program</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>Demonstration of PFAS destruction technologies for investigation derived wastes. Initial demonstrations of predictive corrosion models. Expansion of efforts to develop tools to guide installation staff as they adapt to the impacts of climate change.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The decrease reflects the rephasing of funds between FY 2022 and FY 2024.</p>			
<p>Title: Energy Technology Demonstration/Validation</p> <p>Description: Funds are programmed for investments in energy projects that constitute the Installation Energy Test Bed Initiative. This initiative responds to Congressional direction for the Department to increase energy efficiency, reduce installation energy intensity, increase the use of renewable energy, and improve energy security. Emerging energy technologies offer the DoD a cost effective opportunity to meet these requirements on its installations while reducing energy and operational costs. The DoD test bed program validates and tests the operational cost and performance of innovative energy technologies in a real-world integrated building environment so as to reduce risk, overcome the barriers to deployment, and facilitate wide-scale deployment. The test bed program exploits the Department's existing built infrastructure to evaluate energy efficiency and renewable energy technologies under the varied climatic conditions and building types the DoD manages. The test bed's key elements are: 1) competitive selection of new technologies, 2) systematic and consistent evaluation to determine performance, operational readiness and life cycle costs, and 3) development of guidance and design information for future deployment across installations.</p> <p>FY 2022 Plans: Completion of energy storage demonstrations within the DoD microgrids as one component of increased installation energy resilience. Broadening of the energy efficiency technology demonstrations integrated with Utility Energy Services Contract (UESC) to wider variety of Utility Services Companies as a way to facilitate tech transfer of previously-demonstrated energy technologies into wide adoption. Transition demonstrations of microgrid technologies that show promise at test beds to the DoD installations to collect performance data under real-world conditions. Demonstrate technologies for affordable energy assurance at National Guard installations. Demonstrate technologies for moisture control in the DoD buildings. Initiate planning efforts for the infrastructure required for electrical vehicle adoption at the DoD installations.</p> <p>FY 2023 Plans: Continued demonstrations of microgrid technologies that show promise at test beds to the DoD installations to collect performance data under real-world conditions. Complete demonstrations of technologies for affordable energy assurance at National Guard installations and moisture control in the DoD buildings. Complete initial projects on effective planning for electric vehicle (EV) infrastructure and maintenance. Renewed emphasis on technology transition through UESCs.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>		23.147	39.176
			38.267

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603851D8Z / <i>Environmental Security Technology Certification Program (ESTCP)</i>	Project (Number/Name) 514 / <i>Environmental Security Technology Certification Program</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
The change reflects the rephasing of funds between FY 2022 and FY 2024.			FY 2023
Title: Sustainable Technologies Evaluation and Demonstration Program Description: The Sustainable Technology Evaluation and Demonstration (STED) Program demonstrates technologies to address climate mitigation and Executive Order 14057, "Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability." FY 2022 Plans: Not Applicable FY 2023 Plans: Increase the Sustainable Technology Evaluation and Demonstration (STED) Program focus to address climate mitigation and Executive Order 14057, "Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability." Continue sustainable technology demonstrations at the DoD installations and other federal facilities to demonstrate and validate performance and cost effectiveness of sustainable alternatives. Expand STED Program awareness and outreach by conducting sustainable technology expos at federal facilities and providing sustainable product training to the DoD personnel. FY 2022 to FY 2023 Increase/Decrease Statement: New Start in FY 2023 to enable implementation of Executive Order 14057.		3.000	3.000
Title: Installation Climate Resilience Technology Demonstration/Validation Description: Funds are programmed for investments in projects that address priority resilience needs of Department of Defense installations. Accomplishments/plans are described for each FY below. FY 2022 Plans: Initiate efforts to update the Defense Regional Sea Level Rise (DRSL) database to incorporate latest modeling guidance. FY 2023 Plans: Initiate demonstration projects on Impact of Climate Change on DoD Buildings, Climate Impacts on the DoD Water Infrastructure, Analyzing the Impacts of Weather Events on the DoD Installations, and Improving Climate Resilience of the DoD Installation and Surrounding Community Infrastructure. FY 2022 to FY 2023 Increase/Decrease Statement: Additional effort in this Program Area to support of national and Department of Defense emphasis on resilience of operations to climate change.		0.000	13.094
Accomplishments/Planned Programs Subtotals		72.135	84.638

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603851D8Z / <i>Environmental Security Technology Certification Program (ESTCP)</i>	Project (Number/Name) 514 / <i>Environmental Security Technology Certification Program</i>
<p>C. Other Program Funding Summary (\$ in Millions) N/A</p> <p>Remarks</p> <p>D. Acquisition Strategy The ESTCP solicits proposals from all of the DoD organizations, other Federal Agencies, and the commercial sector. Projects are selected based on an annual competitive process through reviews by multi-agency panels.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603851D8Z / Environmental Security Technology Certification Program (ESTCP)				Project (Number/Name) 514 / Environmental Security Technology Certification Program					
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Support Contract	C/IDDQ	Noblis : Reston, VA	25.671	2.940	Jan 2019	3.500		3.200	Jul 2022	-		3.200	-	-	32.000
Subtotal			25.671	2.940		3.500		3.200		-		3.200	-	-	N/A
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Installation Energy and Water	C/Various	Various : Various	213.702	22.177		38.021		36.795		-		36.795	-	-	-
Weapons Systems and Platforms	C/Various	Various : Various	79.425	10.331		13.722		8.272		-		8.272	-	-	-
Munitions Response	C/Various	Various : Various	56.409	5.727		4.917		4.849		-		4.849	-	-	-
Environmental Restoration	C/Various	Various : Various	93.789	23.356		52.030		8.842		-		8.842	-	-	-
Resource Conservation and Resiliency	C/Various	Various : Various	49.264	4.604		7.547		7.131		-		7.131	-	-	-
Sustainable Technologies Evaluation and Demonstration Program	C/Various	Various : Various	2.000	3.000		3.000		3.000		-		3.000	-	-	-
Installation Climate Resilience	C/Various	Various : Various	0.000	0.000		0.000		12.549		-		12.549	-	-	-
Subtotal			494.589	69.195		119.237		81.438		-		81.438	-	-	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			520.260	72.135		122.737		84.638		-		84.638	-	-	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603851D8Z / Environmental Security Technology Certification Program (ESTCP)	Project (Number/Name) 514 / Environmental Security Technology Certification Program
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ID	Task Name	Start	Finish	2022				2023				2024	
				Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2
1	FY-21 In-Progress Reviews	9/1/2022	11/30/2022										
2	Develop FY-22 Program	1/1/2022	9/30/2022										
3	FY-22 In-Progress Reviews	2/1/2023	11/30/2023										
4	Develop FY-23 Program	1/1/2023	9/30/2023										

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603851D8Z / Environmental Security Technology Certification Program (ESTCP)	Project (Number/Name) 514 / Environmental Security Technology Certification Program
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ID	Task Name	Start	Finish	2023				2024				2025	
				Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2
1	FY 2022 In-Progress Reviews	9/1/2023	11/30/2023										
2	Develop FY 2023 Program	1/1/2023	9/30/2023										
3	FY 2023 In-Progress Reviews	2/1/2024	11/30/2024										
4	Develop FY 2024 Program	1/1/2024	9/30/2024										

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603851D8Z / Environmental Security Technology Certification Program (ESTCP)	Project (Number/Name) 514 / Environmental Security Technology Certification Program	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>In Progress Reviews</i>				
FY 2022 In Progress Reviews	2	2023	1	2024
FY 2023 In Progress Reviews	2	2024	1	2025
<i>Develop Program</i>				
Develop FY 2023 Program	2	2023	4	2023
Develop FY 2024 Program	2	2024	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>					R-1 Program Element (Number/Name) PE 0603923D8Z I <i>Coalition Warfare Program (CWP)</i>							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	92.288	9.975	5.074	11.154	0.000	11.154	12.266	10.563	10.338	10.546	-	-
923: <i>Coalition Warfare</i>	92.288	9.975	5.074	11.154	0.000	11.154	12.266	10.563	10.338	10.546	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression, Defend the Homeland, and Build Sustainable and Long-Term Advantage.

The Coalition Warfare Program (CWP) supports the DoD organizations that: 1) work with foreign partners to collaboratively address strategic technology gaps for current and future missions; 2) develop interoperability solutions for coalition operations; and 3) develop and strengthen defense relationships. It comprehensively supports the 2021 Interim National Security Strategic Guidance that states we will only succeed in advancing American interest and upholding our universal values by working in common cause with our closest allies and partners. We will reinvigorate and modernize our alliances and partnerships; and strengthen and stand behind our allies, work with like-minded partners, and pool our collective strength to advance shared interests and deter common threats. The CWP provides a broad base of technological, operational, and logistical support for military operations and eases the U.S. financial and manpower burdens associated with meeting military goals and objectives. Coalitions and relationships with international partners are high priorities for the nation and the Department of Defense.

The CWP supplements U.S. Government proponents' funding for cooperative efforts, ensuring U.S. funds are sufficient to complete the engagement with the foreign partners. When the CWP funds are used to help fund a cooperative project, that project leverages technical and financial contributions of the foreign partners and accelerates the development and delivery of technical solutions to the warfighter. For every \$1 the CWP has invested in cooperative projects with 81 partners since 2001, the program has leveraged \$3 in foreign partner resources and \$2 in other U.S. Government resources. The CWP funding enables the DoD project teams to transition technology to operational use, further development, or integration into other systems. These projects may also form the basis for future cooperation with international partners.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603923D8Z I <i>Coalition Warfare Program (CWP)</i>
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B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	10.123	5.103	0.000	0.000	0.000
Current President's Budget	9.975	5.074	11.154	0.000	11.154
Total Adjustments	-0.148	-0.029	11.154	0.000	11.154
• Congressional General Reductions	-	-0.029			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.148	-			
• Adjustments to Budget Year.	-	-	11.154	0.000	11.154

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603923D8Z / <i>Coalition Warfare Progra m (CWP)</i>				Project (Number/Name) 923 / <i>Coalition Warfare</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
923: <i>Coalition Warfare</i>	92.288	9.975	5.074	11.154	0.000	11.154	12.266	10.563	10.338	10.546	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Coalition Warfare Program (CWP) supports the DoD organizations that: 1) work with foreign partners to collaboratively address strategic technology gaps for current and future missions; 2) develop interoperability solutions for coalition operations; and 3) develop and strengthen defense relationships. It comprehensively supports the 2021 Interim National Security Strategic Guidance that states we will only succeed in advancing American interest and upholding our universal values by working in common cause with our closest allies and partners. We will reinvigorate and modernize our alliances and partnerships; and strengthen and stand behind our allies, work with like-minded partners, and pool our collective strength to advance shared interests and deter common threats. The CWP provides a broad base of technological, operational, and logistical support for military operations and eases the U.S. financial and manpower burdens associated with meeting military goals and objectives. Coalitions and relationships with international partners are high priorities for the nation and the Department of Defense.

The CWP supplements U.S. Government proponents' funding for cooperative efforts, ensuring U.S. funds are sufficient to complete the engagement with the foreign partners. When the CWP funds are used to help fund a cooperative project, that project leverages technical and financial contributions of the foreign partners and accelerates the development and delivery of technical solutions to the warfighter. For every \$1 the CWP has invested in cooperative projects with 81 partners since 2001, the program has leveraged \$3 in foreign partner resources and \$2 in other U.S. Government resources. The CWP funding enables the DoD project teams to transition technology to operational use, further development, or integration into other systems. These projects may also form the basis for future cooperation with international partners.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Coalition Warfare Program (Continuing Projects)	9.975	5.074	11.154
Description: The CWP provides funding on a competitive basis to the DoD organizations to conduct cooperative research, development, test, and evaluation projects with foreign partners. The goals of the CWP program are to: collaboratively address strategic technology gaps for current and future missions, develop interoperability solutions for coalition operations, and strengthen current and future defense partnerships. The CWP selects projects for funding through an annual competitive selection process in accordance with Department of Defense and Combatant Command needs.			
In addition to funding newly selected projects, the program also provides funding to projects that began in earlier selection cycles (for a total of up to three years of funding for each project).			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603923D8Z / <i>Coalition Warfare Program (CWP)</i>	Project (Number/Name) 923 / <i>Coalition Warfare</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>Currently, the funded portfolio includes projects governed by negotiated/signed international agreements with 21 different foreign partners. Including prior year project selections, the following FY 2022 projects encompass the CWP funding in FY 2022 and FY 2023:</p> <ul style="list-style-type: none"> • Development, Test, and Evaluation of the Binocular Near Infrared Optical Augmentation (NIRO) Device (BINO NIRO) (US Marine Corps) • Chemical Biological Wide Area Decontamination (CBWAD) (US Army) • Solid State High Power Microwave (HPM) Cannon (COMPACT HPM) (US Air Force) • Robust Anti-Submarine Warfare (ASW) Detection & Tracking Capability for High Clutter Environments (ROBUST ASW) (US Navy) • Selective Cyber Information Access (SCIA) (US Air Force) <p>Interoperability and Collaboration Initiatives: Program provides funds in support of new or planned acquisition programs with the aim of 1) promoting coalition interoperability early in the requirements or technical development phases, 2) harmonizing common goals between U.S. and foreign partners, 3) improving management of collaborative efforts. These funds support workshops, risk reduction efforts, standards development, architecture analysis, and information management initiatives.</p> <p>FY 2022 Plans: Completion of efforts that will:</p> <ul style="list-style-type: none"> • Develop ultra-compact Space Situation Awareness (SSA) sensor to fit on nanosats and track space objects and debris in real-time (SAND); • Develop prototype communication protocols to test systems controlling multiple Unmanned Underwater Vehicles from a single Unmanned Surface Vehicle (USV) mothership and enhance navigation accuracy of fielded UUVs (USV-MOTHER) • Develop/validate new class of multirole 5000 series aluminum-magnesium alloys for improved welded strength, ballistics, and marine corrosion resistance in ground, amphibious, and sea systems (AL-MG ALLOYS) • Advance previously developed small scalable kinetic weapons demonstrator hardware to a robust all-weather/night time, moving target munition and demonstrate in-ground and flight test (SSKW-2) • Improve Coalition exploitation of Weapons of Mass Destruction underground facilities (ATE) • Develop a low light level, digital fused goggle with augmented reality for enhanced soldier mobility and lethality (DELTA-I) • Develop terrestrial laser-communications network system to provide uninterrupted, ant-jam, real-time data/video links and Intelligence, Surveillance, and Reconnaissance (ISR) operations (LASER COMM NET) • Develop microsatellites with onboard automated identification system and imagery based ship detection fused to provide maritime domain awareness (MICROSAT) • Establish capability for space solar cell calibration to enable accurate calculation on orbit power for all military and commercial spacecraft (SOLARCELLCAL) 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603923D8Z / <i>Coalition Warfare Program (CWP)</i>	Project (Number/Name) 923 / <i>Coalition Warfare</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> • Develop new rapid bomb crater repair solutions for roads and airfields in extreme cold weather conditions (CRADR) • Develop a gas-generator solid propellant fueled rotating detonation engine for high speed operations and demonstrate tactical missile propulsion system with 2-5x longer range (SPEAR) • Develop revolutionary infrared non-mechanical beam steering (NMBS) devices using operationally-relevant laser sources for low Size, Weight, and Power (SWaP) and high speed applications (ALIS) • Develop a new high-frequency propagation code for correct assessment of impact of short-scale ionospheric density irregularities on geolocation (MPDI) <p>FY 2023 Plans: Completion of efforts that will:</p> <ul style="list-style-type: none"> • Develop launch, recovery, and teaming of Hybrid/Vertical Take-off and Landing Unmanned Aerial Systems (UAS) (VTUAS) with autonomous sea and ground vehicles (VTUAS) • Develop dynamic Resource Allocation Management (RAM) applications and decision aids to allow both coalition warfighters to operate efficiently in the electromagnetic spectrum (EMW RAM) • Develop Long Wavelength Infrared (LWIR)/Very Long Wavelength Infrared (VLWIR) camera for standoff detection of buried Improvised Explosive Devices (IED) (IED CAM) • Develop a standards based Mission Partner Gateway eXtended (MPGW-X) solution to improve the exchange of command and control information during contingency operations (MPGW-X) • Develop automated infrasonic detection and localization software for persistent surveillance (MSAIW) • Advance understanding of near sunset ionospheric structures to improve predictions for space environment disturbance effects that impact operational radio telecommunications, surveillance systems, and GPS signals propagation (SPORT) • Develop a boost to ramjet operation burn of a liquid-fueled integral rocket ramjet in full-scale ground experimentation (THRESHER B2B) • Develop advanced technology demonstration of next-generation air-breathing munition for long-range precision fires to achieve range increase on the order of 3-6 times from existing gun weapon systems (ABLRMD) • Create a distributed contextually aware, heterogeneous collaborative Counter Unmanned Aerial System (CUAS) capability against multi-agent UAS threats (CHCUAS) • Develop space environment sensors and tools for common Space Situational Awareness (SSA) picture enabling a neighborhood watch capability for space attack assessment (Common SSA) • Develop a low-cost, low-weight chemical detection payload for a Black Hornet 3 micro UAS (MACS) • Develop lightweight ceramic armor that exceeds the performance of currently fielded armor materials (NANO B4C ARMOR) • Characterize region-specific threats to coalition warfighters subject to infectious diseases (severe acute respiratory infections (SARI), Middle East Respiratory Syndrome (MERS), and Coronavirus (CoV) and establish clinical trials (SARI) 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603923D8Z / <i>Coalition Warfare Program (CWP)</i>	Project (Number/Name) 923 / <i>Coalition Warfare</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> • Develop a distributed collaborative development and simulation test bed capability connected to coalition nation defense labs to facilitate rapid prototype testing and experimentation to address warfighter challenges (VIPRE) • Develop a fieldable prototype man portable system that is immune to detection (WARWS) • Develop an air-launched UAS and carriage/launch systems to address extended range communication needs (ALUAS) • Develop an open standards architecture to enable “plug-n-play” insertion of assistive artificial intelligence (AI) agents into coalition intelligence processing systems and build a new generation of AI enabled smart sensors (CATE) • Deploy advanced diagnostics in multiphase reactive blast tests (HMRB) • Deliver real-time hazard awareness using the Mission Partner Environment (MPE) for the automated exchange of digital threat data and analytics in a multinational common operating picture (ITAC) • Develop low-cost non-cooperative space-based maritime surveillance technologies (LLAMDA) • Develop a light weight transparent armor (LWTA) to defeat 7.62X39 threats using revolutionary energy guiding layer concept (LWTA) • Develop ultra-low power sensors for integration into stealth underwater power sources (LPS) • Develop a manufacturing process with a novel high temperature alloy that fabricates small/medium scale turbine engine components for high-speed propulsion (MANTAS) • Test quality assurance Non-destructive Inspection (NDI) surface analysis devices for surface preparation inspections prior to structural adhesive bonding on composites (SAT REVIEW) • Develop AI agent Models that represent allied and enemy forces to assess operation plans, improve course of action development, inform combat decision-making, enhance force structure analysis, accelerate intelligence preparation of the battlefield, and improve realistic training (WARGAMING) <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> The FY 2023 funding request was increased by \$6.051 million to support the Secretary's guidance to streamline operations, increase efficiency, and promote greater affordability within the OSD, Defense Agencies, and Field Activities; and to ensure the Department's optimum alignment to the National Defense Strategy and DoD strategic guidance, with particular focus on building a more lethal, resilient, agile, and ready force while strengthening alliances, prioritizing cyber and space capabilities, and focusing on innovation to maintain the technological advantage.</p>			
Accomplishments/Planned Programs Subtotals		9.975	5.074
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603923D8Z / Coalition Warfare Program (CWP)	Project (Number/Name) 923 / Coalition Warfare
D. Acquisition Strategy <p>The Combatant Commands, Services, Defense Agencies, and the Office of the Secretary of Defense nominate candidate projects on an annual basis. CWP provides selected projects up to three years of funding. The Program selects projects that address DoD priorities and meet the needs and requirements specified by the Joint Staff and the Combatant Commanders. Projects have equitable contributions from international partners, strong potential for transition, Combatant Command endorsement, and contribute to allied interoperability and/or meet a user need.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0603923D8Z I Coalition Warfare Progra m (CWP)				Project (Number/Name) 923 I Coalition Warfare					
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Coalition Warfare Program Project Product Development Costs	Various	Various : Various	68.081	8.234		3.838		9.341		0.000		9.341	-	-	-
Subtotal			68.081	8.234		3.838		9.341		0.000		9.341	-	-	N/A
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Coalition Warfare Program Project Test and Evaluation Costs	Various	Various : Various	13.825	0.896		0.386		0.933		0.000		0.933	-	-	-
Subtotal			13.825	0.896		0.386		0.933		0.000		0.933	-	-	N/A
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Coalition Warfare Program Project Management Services Costs	Option/ FFP	Analysence, INC. : Fulton, MD	10.382	0.845		0.850		0.880		0.000		0.880	-	-	-
Subtotal			10.382	0.845		0.850		0.880		0.000		0.880	-	-	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			92.288	9.975		5.074		11.154		0.000		11.154	-	-	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense										Date: April 2022			
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603923D8Z / <i>Coalition Warfare Program (CWP)</i>					Project (Number/Name) 923 / <i>Coalition Warfare</i>			

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
FY 2021 CWP Project Execution																												
FY 2022 CWP Project Selection																												
FY 2022 CWP Project Execution																												
FY 2023 CWP Project Selection																												
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FY 2026 CWP project Selection																												
FY 2026 CWP Project Execution																												
FY 2027 CWP project Selection																												
FY 2027 CWP Project Execution																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603923D8Z / Coalition Warfare Program (CWP)	Project (Number/Name) 923 / Coalition Warfare	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
FY 2021 CWP Project Execution	1	2021	4	2022
FY 2022 CWP Project Selection	3	2021	3	2021
FY 2022 CWP Project Execution	1	2022	4	2023
FY 2023 CWP Project Selection	2	2022	2	2022
FY 2023 CWP Project Execution	1	2023	4	2024
FY 2024 CWP Project Selection	2	2023	2	2023
FY 2024 CWP Project Execution	1	2024	4	2025
FY 2025 CWP Project Selection	2	2024	2	2024
FY 2025 CWP Project Execution	1	2025	4	2026
FY 2026 CWP project Selection	2	2025	2	2025
FY 2026 CWP Project Execution	1	2026	4	2027
FY 2027 CWP project Selection	2	2026	2	2026
FY 2027 CWP Project Execution	1	2027	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604011D8Z I <i>Next Generation Information Communications Technology (5G)</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	251.965	428.127	336.485	249.591	0.000	249.591	182.428	162.348	89.959	72.747	Continuing	Continuing
724: <i>Dual Use 5G Use Cases</i>	150.292	234.206	72.000	45.572	0.000	45.572	148.758	98.555	42.555	44.082	Continuing	Continuing
725: <i>Congested/Congested Spectrum</i>	89.581	192.317	250.485	181.840	0.000	181.840	23.291	53.414	37.025	18.077	Continuing	Continuing
726: <i>External Engagement</i>	12.092	1.604	14.000	19.679	0.000	19.679	10.379	10.379	10.379	10.588	Continuing	Continuing
729: <i>5G Cross Functional Team</i>	-	0.000	0.000	2.500	-	2.500	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Defend the Homeland, Build Sustainable and Long-Term Advantage, and Build a Resilient Joint Force and Defense Ecosystem.

The Department of Defense (DoD) Next Generation (NextG) Information Communications Technologies (ICT) program will conduct large-scale experimentation and prototyping of dual-use (military and commercial) fifth-generation (5G) cellular network technology for military uses. The program will develop and deploy 5G networks at DoD sites to evaluate and enhance 5G systems and technologies for CONUS and OCONUS DoD missions. This will include both the direct use of commercially available capabilities and DoD-specific technology enhancements and applications that highly leverage commercial capabilities. The program will also develop, test, and evaluate technology solutions to identify and mitigate the security challenges that 5G and NextG technologies will present in order to enable the military to operate through untrusted networks.

The program will:

- Deploy flexible 5G infrastructure at twelve or more U.S. military facilities to enable varied applications and networking prototypes,
- Evaluate at least twenty different DoD 5G applications at DoD facilities across the Services based on parallel commercial applications and technologies,
- Demonstrate the capacity to “operate through” existing commercial 5G infrastructure throughout the globe, leveraging existing infrastructure to meet DoD mission needs and learning how to utilize untrusted 5G networks through automated security techniques.

The program will deliver fieldable prototype capabilities that will remain in place at designated DoD locations as well as lessons learned to promulgate 5G knowledge and tradecraft. This will ensure that both near-term and future generations of information and communications technologies will be capable of supporting US military and national security objectives.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604011D8Z / <i>Next Generation Information Communications Technology (5G)</i>
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The program will be executed through established support agreements with DoD Service laboratories and through existing DoD and Government-Wide Acquisition Contracts (GWACs), to include General Services Administration (GSA, contracts) that are suitable and cost-effective for 5G technology prototyping and telecommunications network equipment procurement and integration.

B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	428.127	374.665	0.000	0.000	0.000
Current President's Budget	428.127	336.485	249.591	0.000	249.591
Total Adjustments	0.000	-38.180	249.591	0.000	249.591
• Congressional General Reductions	-	-37.000			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• FFRDC	-	-1.180	-	-	-
• Adjustments to Budget Year	-	-	243.395	-	243.395
• Funding Realignment	-	-	-2.500	-	-2.500
• Economic Assumption	-	-	8.696	-	8.696

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 725: *Congested/Congested Spectrum*

Congressional Add: *5G SPECTRUM Reallocation Mitigation*

Congressional Add Subtotals for Project: 725

Congressional Add Totals for all Projects

<u>FY 2021</u>	<u>FY 2022</u>
10.000	-
10.000	-
10.000	-

Change Summary Explanation

FY 2022 Appropriation reduced by -\$37.000 for:

- o -\$32.000 million - Tranche 2 growth without transition plans
- o -\$5.000 million - External engagement - unjustified and excess growth

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604011D8Z / Next Generation Information Communications Technology (5G)				Project (Number/Name) 724 / Dual Use 5G Use Cases			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
724: Dual Use 5G Use Cases	150.292	234.206	72.000	45.572	0.000	45.572	148.758	98.555	42.555	44.082	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Develop and experiment with “dual-use” applications that demonstrate direct use of commercial systems and applications that use a large fraction of commercial capabilities that are augmented with DoD enhancements. Dual-use applications will be evaluated within a deployed 5G infrastructure with operationally relevant numbers of users and geographic scale.

These use cases include:

- Mission Planning/Training: Develop and experiment with ultra-high reliability, low latency, high bandwidth communications, as well as augmented and virtual reality (AV/VR) technologies that enable high fidelity mission planning and training in realistic environments over 5G networks.
- Depot Operations: Leverage 5G technologies to upgrade depots for “smart” operations including autonomous repair and maintenance activities as well as warehouse movement via driverless forklifts, pallets, and tactical trucks.
- Global Asset/Supply Chain Management: Leverage emerging 5G enterprise solutions to provide real time, optimum, continuous asset visibility and movement tracking, supply status, movement and resupply, and reduce inventory control costs.
- Smart Installations (e.g., logistics bases, ports): Develop and experiment with 5G enabled massive machine-to-machine communications, cloud and edge computing, and autonomy to enhance installation operations to maximize logistics traffic throughput.

Dual-use 5G research, development, and experimentation activities will deliver fieldable prototype capabilities that will remain in place at designated DoD locations. Those that do not perform sufficiently well will still provide lessons learned to promulgate 5G knowledge and tradecraft. These deliverables will inform base/camp/station modernization and recapitalization investments as prototypes transition to enduring infrastructure.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Dual Use 5G Use Cases	234.206	72.000	45.572
Description: Demonstrate use cases of both commercial and military value, while also assessing and developing mitigations to their security vulnerabilities.			
FY 2022 Plans: The DoD will continue Smart Warehouse prototyping and experimentation activities at MCLBA, and NBSD; and will continue AR/VR Mission Training prototyping and experimentation activities at JBLM. Construction of localized full scale 5G mobile cellular			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604011D8Z / <i>Next Generation Information Communications Technology (5G)</i>	Project (Number/Name) 724 / <i>Dual Use 5G Use Cases</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>networks will be completed and experimentation with autonomous warehouse operations and AR/VR mission training activities will be conducted.</p> <p>The DoD will continue with the development of approximately five additional dual-use prototyping and experimentation projects at Joint Base Pearl Harbor - Hickam, Naval Station Norfolk, Camp Pendleton, the National Training Center, and Joint Base San Antonio. Localized full scale 5G mobile cellular networks will be designed and initially constructed in order to support the dual-use military application experimentation at these DoD Service sites. The additional sites will experiment with AR/VR for aircraft readiness, ship-wide and pier-side connectivity, rapidly deployable 5G for tactical command and control centers, and AR/VR for medical applications to include training.</p> <p>The DoD will initiate additional experiments at existing DoD Service sites and initiate approximately three additional sites for dual use prototyping and experimentation projects.</p> <p>FY 2023 Plans: The DoD will conclude a number of Smart Warehouse prototyping and experimentation activities at MCLBA, and NBSD; and will finish AR/VR Mission Training prototyping and experimentation activities at JBLM. Experimentation with autonomous warehouse operations and AR/VR mission training activities will conclude. The program will begin technology transitions and start transferring sites to services.</p> <p>The DoD will continue dual-use prototyping and experimentation projects at Joint Base Pearl Harbor - Hickam, Naval Station Norfolk, Camp Pendleton, the National Training Center, and Joint Base San Antonio. Localized full scale 5G mobile cellular networks will continue to support the dual-use military application experimentation at these DoD Service sites. The sites will continue experimentation with AR/VR for aircraft readiness, ship-wide and pier-side connectivity, rapidly deployable 5G for tactical command and control centers, and AR/VR for medical applications to include training.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Level of effort decreases between FY 2022 and FY 2023 due to the DoD experimentation sites having been constructed in FY 2020 and FY 2021, with experimentation continuing in FY 2023.</p>			
Accomplishments/Planned Programs Subtotals		234.206	72.000
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604011D8Z / Next Generation Informat ion Communications Technology (5G)	Project (Number/Name) 724 / Dual Use 5G Use Cases
D. Acquisition Strategy N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604011D8Z / <i>Next Generation Information Communications Technology (5G)</i>				Project (Number/Name) 724 / <i>Dual Use 5G Use Cases</i>					

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Dual Use 5G Use Cases	MIPR	Army, Navy, Air Force, etc. : Various	150.292	234.206	Mar 2021	72.000	Jun 2022	45.572	Jun 2023	-		45.572	Continuing	Continuing	-
Subtotal			150.292	234.206		72.000		45.572		-		45.572	Continuing	Continuing	N/A

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	150.292	234.206		72.000		45.572	-		N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense																Date: April 2022			
Appropriation/Budget Activity 0400 / 4								R-1 Program Element (Number/Name) PE 0604011D8Z / <i>Next Generation Information Communications Technology (5G)</i>								Project (Number/Name) 724 / <i>Dual Use 5G Use Cases</i>			

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Dual Use 5G Use Cases																												
Initiate Smart Warehouse prototyping and experimentation projects																												
Initiate an Augmented/Virtual Reality (AR/VR) Mission Training prototyping and experimentation																												
Expansion of localized full scale 5G mobile cellular networks																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604011D8Z / Next Generation Information Communications Technology (5G)	Project (Number/Name) 724 / Dual Use 5G Use Cases	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Dual Use 5G Use Cases				
Initiate Smart Warehouse prototyping and experimentation projects	1	2021	4	2023
Initiate an Augmented/Virtual Reality (AR/VR) Mission Training prototyping and experimentation	1	2021	4	2023
Expansion of localized full scale 5G mobile cellular networks	2	2021	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604011D8Z / Next Generation Informat ion Communications Technology (5G)				Project (Number/Name) 725 / Congested/Congested Spectrum			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
725: Congested/Congested Spectrum	89.581	192.317	250.485	181.840	0.000	181.840	23.291	53.414	37.025	18.077	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Demonstrate the capacity to “operate through” existing commercial 5G infrastructure throughout the globe, leveraging existing infrastructure to meet DoD mission needs using dynamic spectrum utilization and controlled manipulation of 5G network security architectures. These capabilities will be based on technologies such as dynamic spectrum utilization to maximize availability and resilience for wireless connectivity, multi-networking across wired and wireless systems for finding and exploiting alternate paths and redundant paths to ensure secure and reliable communication, network monitoring including new artificial intelligence (AI) techniques that use both passive and active measurements to assess security threats and identify potential mitigations. Develop tactical, operational, and strategic networking prototypes to demonstrate capabilities to dynamically balance use of congested spectrum between military systems and commercial wireless networks.

Capabilities will be prototyped and evaluated at-scale within highly dynamic and contested radio frequency (RF) environments. The Congested/Contested Spectrum research, development, and experimentation activities will deliver fieldable prototype capabilities that will remain in place at designated DoD locations. Those that do not perform sufficiently well will still provide lessons learned to promulgate 5G knowledge and tradecraft. These deliverables will inform base/camp/station modernization and recapitalization investments as prototypes transition to enduring infrastructure.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Congested/Contested Spectrum	182.317	250.485	181.840
Description: Demonstrate the capacity to “operate through” in congested/contested environments using dynamic spectrum utilization and by prototyping technologies to both defend and exploit 5G networks.			
FY 2022 Plans: Continue congested/contested spectrum prototyping and experimentation activities at Hill AFB. Continue the evaluation of the impact of the 5G network on the airborne radar systems and the radar’s impact on the 5G network to enable co-use or coexistence. Continue development of a network to disaggregate and mobilize command and control architectures at Nellis AFB, to include experimentation with 5G-enabled disaggregated command and control capabilities.			
The DoD will continue congested/contested spectrum prototyping and experimentation at Tinker AFB, and experimentation with 5G Core security and interoperability in the project centered at Joint Base San Antonio.			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604011D8Z / <i>Next Generation Information Communications Technology (5G)</i>	Project (Number/Name) 725 / <i>Congested/Congested Spectrum</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>The DoD will continue investments in key technologies for use in contested environments, to enable “operating through” adversary impediments on 5G networks.</p> <p>FY 2023 Plans: Continue congested/contested spectrum prototyping and experimentation activities at Hill AFB. Continue the evaluation of the impact of the 5G network on the airborne radar systems and the radar’s impact on the 5G network to enable co-use or coexistence. Continue development of a network to disaggregate and mobilize command and control architectures at Nellis AFB, to include experimentation with 5G-enabled disaggregated command and control capabilities.</p> <p>The DoD will continue congested/contested spectrum prototyping and experimentation at Tinker AFB, and experimentation with 5G Core security and interoperability in the project centered at Joint Base San Antonio.</p> <p>The DoD will continue investments in key technologies for use in contested environments, to enable “operating through” adversary impediments on 5G networks.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding program reduced between FY 2022 and FY 2023 will result in a Tranche 3 not being completed, and the delay of portions of the Operate Through work from starting.</p>			
Accomplishments/Planned Programs Subtotals		182.317	250.485
		FY 2021	FY 2022
Congressional Add: 5G SPECTRUM Reallocation Mitigation		10.000	-
FY 2021 Accomplishments: DoD expanded investments in the evaluation of midband spectrum reallocation and associated impact mitigation requirements.			
Congressional Adds Subtotals		10.000	-
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604011D8Z / Next Generation Information Communications Technology (5G)					Project (Number/Name) 725 / Congested/Congested Spectrum				
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Congested/Contested Spectrum	MIPR	Army, Navy, Air Force, Marine Corps, etc. : Various	89.581	192.317	Mar 2021	250.485	Mar 2022	181.840	Mar 2023	-		181.840	Continuing	Continuing	-
Subtotal			89.581	192.317		250.485		181.840		-		181.840	Continuing	Continuing	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			89.581	192.317		250.485		181.840		-		181.840	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604011D8Z / <i>Next Generation Information Communications Technology (5G)</i>	Project (Number/Name) 725 / <i>Congested/Congested Spectrum</i>
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FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Congested/Contested Spectrum	
Initiate congested/contested spectrum prototyping and experimentation activities at Hill AFB, Utah	
Design and construct a localized full scale 5G mobile cellular network	

FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Congested/Contested Spectrum	
Initiate congested/contested spectrum prototyping and experimentation activities at Hill AFB, Utah	
Design and construct a localized full scale 5G mobile cellular network	

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604011D8Z / <i>Next Generation Information Communications Technology (5G)</i>	Project (Number/Name) 725 / <i>Congested/Congested Spectrum</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Congested/Contested Spectrum</i>				
Initiate congested/contested spectrum prototyping and experimentation activities at Hill AFB, Utah	4	2020	4	2023
Design and construct a localized full scale 5G mobile cellular network	1	2021	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604011D8Z / Next Generation Information Communications Technology (5G)				Project (Number/Name) 726 / External Engagement			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
726: External Engagement	12.092	1.604	14.000	19.679	0.000	19.679	10.379	10.379	10.379	10.588	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Funding from this project will be used to conduct external engagements across Government and beyond to influence statutes, policies, regulations, and standards within DoD, the U.S. Government, and international bodies for the global deployment and use of 5G to Next G technologies. DoD will conduct active and passive security vulnerability assessments of 5G prototypes in order to support zero-trust security designs for military 5G applications.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<p>Title: External Engagement</p> <p>Description: Develop policies, regulations, and standards for streamlined deployment of protected, resilient Government and commercial networks. Conduct active and passive security vulnerability assessments to support 5G security capabilities.</p> <p>FY 2022 Plans: Continue to engage across government and beyond to inform and influence statutes, policies, regulations, and standards within DoD, the U.S. Government, and international bodies. DoD will continue to conduct security vulnerability assessments and coalition partnership efforts during FY 2022.</p> <p>FY 2023 Plans: Continue to engage across government and beyond to inform and influence statutes, policies, regulations, and standards within DoD, the U.S. Government, and international bodies supporting a forward-thinking Next-G position. DoD will continue to conduct security vulnerability assessments and coalition partnership efforts during FY 2023.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.</p>	1.604	14.000	19.679
Accomplishments/Planned Programs Subtotals	1.604	14.000	19.679

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense													Date: April 2022		
Appropriation/Budget Activity 0400 / 4							R-1 Program Element (Number/Name) PE 0604011D8Z / <i>Next Generation Information Communications Technology (5G)</i>				Project (Number/Name) 726 / <i>External Engagement</i>				

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost		Cost To Complete	Total Cost	Target Value of Contract
External Engagement	MIPR	Army, Navy, Air Force, Marine Corps, etc. : Various	12.092	1.604	Mar 2021	14.000	Mar 2022	19.679	Mar 2023	-		19.679		Continuing	Continuing	-
Subtotal			12.092	1.604		14.000		19.679		-		19.679		Continuing	Continuing	N/A

			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			12.092	1.604		14.000		19.679		-		19.679	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense							Date: April 2022			
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0604011D8Z / Next Generation Information Communications Technology (5G)				Project (Number/Name) 726 / External Engagement		

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
External Engagement																												
Inform and influence statutes, policies, regulations, and standards within DoD, the U.S. Government, and international bodies																												
Conduct security vulnerability assessments of designated Dual-Use and Congested/ Contested Spectrum experimentation efforts																												

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
External Engagement																												
Inform and influence statutes, policies, regulations, and standards within DoD, the U.S. Government, and international bodies																												
Conduct security vulnerability assessments of designated Dual-Use and Congested/ Contested Spectrum experimentation efforts																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604011D8Z / <i>Next Generation Information Communications Technology (5G)</i>	Project (Number/Name) 726 / <i>External Engagement</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
External Engagement				
Inform and influence statutes, policies, regulations, and standards within DoD, the U.S. Government, and international bodies	1	2020	4	2025
Conduct security vulnerability assessments of designated Dual-Use and Congested/Contested Spectrum experimentation efforts	2	2020	4	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604011D8Z / <i>Next Generation Information Communications Technology (5G)</i>				Project (Number/Name) 729 / <i>5G Cross Functional Team</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
729: <i>5G Cross Functional Team</i>	-	0.000	0.000	2.500	-	2.500	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
New start Project Code in FY 2023.

A. Mission Description and Budget Item Justification
The 5G Cross Functional Team will provide coordination of joint warfighting concepts, research and development, policy and program integration, acquisition and transition, and secure operations of 5G in DoD.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: 5G Cross Functional Team (CFT) Support	-	-	2.500
<i>FY 2023 Plans:</i> Provide coordination of joint warfighting concepts, research and development, policy and program integration, acquisition and transition, and secure operations of 5G in DoD.			
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> Increase to support the 5G Cross Functional Team. At the direction of Sec Def. The 5GCFT will assist the Secretary of Defense in determining the Components' roles and responsibilities with respect to the acquisition, sustainment, and operation of 5G wireless networking, and the 5GCFT will assist USD(R&E) in carrying out responsibilities for policy, oversight, guidance, research, and coordination on matters related to 5G wireless networking.			
Accomplishments/Planned Programs Subtotals			2.500

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022		
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604011D8Z / <i>Next Generation Information Communications Technology (5G)</i>				Project (Number/Name) 729 / <i>5G Cross Functional Team</i>				

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
5G Cross Functional Team (CFT) Support	MIPR	TBD : TBD	-	-		-		2.500	Mar 2023	-		2.500	Continuing	Continuing	-	
Subtotal			-	-		-		2.500		-		2.500	Continuing	Continuing	N/A	

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-	-	2.500	-	2.500	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense											Date: April 2022				
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604011D8Z / Next Generation Informat ion Communications Technology (5G)						Project (Number/Name) 729 / 5G Cross Functional Team			

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Project initiation																												
TBD																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604011D8Z / Next Generation Information Communications Technology (5G)	Project (Number/Name) 729 / 5G Cross Functional Team	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Project initiation				
TBD	4	2022	3	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	PE 0604016D8Z I <i>Department of Defense Corrosion Program</i>											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	145.307	5.240	3.241	3.166	-	3.166	3.166	3.194	3.184	3.181	Continuing	Continuing
015: <i>Corrosion Protection Projects</i>	145.307	5.240	3.241	3.166	0.000	3.166	3.166	3.194	3.184	3.181	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiative to Build Sustainable and Long-Term Advantage.

The Department of Defense (DoD) initiated the Corrosion Program in 2003 in response to 10 U.S.C. 2228, which requires the Secretary of Defense to accomplish a number of actions including the implementation of a corrosion prevention/mitigation strategic plan for the DoD equipment and infrastructure. The DoD Corrosion Prevention and Control Strategy was revised and signed in January 2021.

Corrosion remains a significant contributor to maintenance costs for the DoD equipment and facilities. The average annual cost of corrosion to the DoD Major Weapon Systems between 2004 and 2021 was greater than \$16 billion. Between 16% and 25% of total maintenance costs are attributable to corrosion, depending on the type of system. As a result, corrosion also directly contributes to weapon system downtime, reducing system availability.

The DoD Corrosion Program's strategic goal is to demonstrate targeted and effective material and nonmaterial solutions that reduce the corrosion impacts on availability and affordability of the DoD weapon systems and infrastructure. The goal can be achieved through the implementation of changes or solutions in one or more of the following focus areas: accountability; technology development and transition; policy; updated specifications and standards; and workforce development and outreach.

To implement the DoD Corrosion Strategy, the DoD Corrosion Program focuses on (a) Activities and (b) Technology Development and Implementation. Technology development and implementation includes demonstrating and validating mature technologies and advanced research on technologies aimed at reducing cost and increasing availability of the DoD weapon systems and facilities. Activities include research studies and technical support.

Demonstration/validation projects are specific corrosion prevention/mitigation efforts funded by the CPO in the Office of the Secretary of Defense (OSD) with the objective of developing, testing, qualifying, and implementing new technologies. A number of low-risk, high-payoff technologies promise to vastly improve the service life and significantly reduce the maintenance costs and improve the availability and safety of weapon systems and facilities essential to maintain support for the warfighter. A total of 85 projects have been completed including a follow-on assessment of their return-on-investment estimates. The overall return on investment as estimated by the Military Departments is 17:1

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604016D8Z <i>I Department of Defense Corrosion Program</i>
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Advanced research includes Test and Evaluation projects, research studies, and research performed by academic institutions to include the Armed Forces' Academies. The primary objectives are: (1) generate products that contribute to the scientific understanding of material degradation and protection mechanisms, (2) explore the feasibility of technologies or processes for future demonstration/implementation projects, (3) generate knowledge products that contribute to ability to make data-driven decisions to prioritize corrosion prevention investments. Research areas include:

- Improved and validated data analytics and predictive modeling
- Accelerated corrosion test method development
- Improved surface treatments and coatings
- New materials and materials processing techniques

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	5.323	3.259	0.000	0.000	0.000
Current President's Budget	5.240	3.241	3.166	0.000	3.166
Total Adjustments	-0.083	-0.018	3.166	0.000	3.166
• Congressional General Reductions	-	-0.018			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.083	-			
• Adjustments to Budget Year	-	-	3.166	-	3.166

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 015: *Corrosion Protection Projects*

Congressional Add: *DoD Workforce Painter Training*

	FY 2021	FY 2022
	2.000	0.000
Congressional Add Subtotals for Project: 015	2.000	0.000
Congressional Add Totals for all Projects	2.000	0.000

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604016D8Z / Department of Defense Corrosion Program				Project (Number/Name) 015 / Corrosion Protection Projects			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
015: Corrosion Protection Projects	145.307	5.240	3.241	3.166	0.000	3.166	3.166	3.194	3.184	3.181	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Department of Defense (DoD) initiated the Corrosion Program in 2003 in response to 10 U.S.C. 2228, which requires the Secretary of Defense to accomplish a number of actions including the implementation of a corrosion prevention/mitigation strategic plan for the DoD equipment and infrastructure. The DoD Corrosion Prevention and Control Strategy was revised and signed in January 2021.

Corrosion remains a significant contributor to maintenance costs for the DoD equipment and facilities. The average annual cost of corrosion to the DoD Major Weapon Systems between 2004 and 2019 was greater than \$16 billion. Between 16% and 25% of total maintenance costs are attributable to corrosion, depending on the type of system. As a result, corrosion also directly contributes to weapon system downtime, reducing system availability.

The DoD Corrosion Program's strategic goal is to demonstrate targeted and effective material and nonmaterial solutions that reduce the corrosion impacts on availability and affordability of the DoD weapon systems and infrastructure. The goal can be achieved through the implementation of changes or solutions in one or more of the following focus areas: accountability; technology development and transition; policy; updated specifications and standards; and workforce development and outreach.

To implement the DoD Corrosion Strategy, the DoD Corrosion Program focuses on (a) Activities and (b) Technology Development and Implementation. Technology development and implementation includes demonstrating and validating mature technologies and advanced research on technologies aimed at reducing cost and increasing availability of the DoD weapon systems and facilities. Activities include research studies and technical support.

Demonstration/validation projects are specific corrosion prevention/mitigation efforts funded by the CPO in the Office of the Secretary of Defense (OSD) with the objective of developing, testing, qualifying, and implementing new technologies. A number of low-risk, high-payoff technologies promise to vastly improve the service life and significantly reduce the maintenance costs and improve the availability and safety of weapon systems and facilities essential to maintain support for the warfighter. A total of 85 projects have been completed including a follow-on assessment of their return-on-investment estimates. The overall return on investment as estimated by the Military Departments is 17:1.

Advanced research includes Test and Evaluation projects, research studies, and research performed by academic institutions to include the Armed Forces' Academies. The primary objectives are: (1) generate products that contribute to the scientific understanding of material degradation and protection mechanisms, (2) explore the feasibility of technologies or processes for future demonstration/implementation projects, (3) generate knowledge products that contribute to ability to make data-driven decisions to prioritize corrosion prevention investments. Research areas include:

- Improved and validated data analytics and predictive modeling

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604016D8Z / Department of Defense Corrosion Program	Project (Number/Name) 015 / Corrosion Protection Projects		
<ul style="list-style-type: none">• Accelerated corrosion test method development• Improved surface treatments and coatings• New materials and materials processing techniques				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Title: Corrosion Prevention and Control Projects and Activities		3.240	3.241	3.166
<p>Description: Corrosion prevention and control projects and activities are conducted in support of the support of the strategic plan to reduce the impact of corrosion on the cost and availability of DoD equipment and facilities. Projects initiated in FY 2020 include:</p> <ul style="list-style-type: none">•Zinc-rich Aerosol Products for Touch-up Painting of Steel Substrates – Increased efficiency of maintenance processes•Improved Surface Preparation and Coatings for Corrosion Control of Aluminum Substrates – Extending intervals between coating applications•Pressure Sensitive Adhesive Appliques for Quick Field Repair of Topcoat Damage – Improved field-level maintenance•Weld-Through Coatings for Prevention of Crevice Corrosion in Skip-Welded Joints – Service life extension for ground vehicles•COVID-19 Disinfectant Material Corrosion Compatibility testing – Understanding potential maintenance impacts resulting from disinfectant application <p>Support for advanced research in the areas of improving the accuracy of the algorithm for extracting corrosion information from maintenance data, aircraft structural repair using additive manufacturing, optimizing aircraft washdown intervals, corrosion sensor development, analytical corrosion prediction methods, mitigation of biologically induced corrosion, and prediction of environmentally assisted cracking was continued.</p> <p>Projects initiated in FY 2021 include:</p> <ul style="list-style-type: none">•Environmentally Friendly Coating Assessment for Non-Immersed Marine Environment for structures located in coastal environments.•Gentoo Coating Application to HH-60G Tail Landing Gear Yoke to reduce corrosion inspection requirements and improve the durability of the yoke between inspection cycles; improving HH-60 readiness.•Improved Landing Gear Durability for F/A-18E/F Super Hornet evaluating the application of multiple corrosion prevention technologies to improve the landing gear system to improve readiness and reduce cost.•Ship Class Topside Corrosion Control Configuration (CT3C) Implementation multiple corrosion prevention technologies to improve the improve ship operational sustainment and reduce cost•Property-driven determination of acceptable criteria in MIL-DTL-46027 (weldable aluminum armor) for enhanced sustainability and readiness to evaluate the corrosion susceptibility characteristics and impact due desensitization of aluminum alloys. Evaluating aerospace applications for Zn-Ni coatings as an alternative to Cd coatings to improve corrosion performance while reducing environmental and human safety impacts.				

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604016D8Z / <i>Department of Defense Corrosion Program</i>	Project (Number/Name) 015 / <i>Corrosion Protection Projects</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>Activities executed included:</p> <ul style="list-style-type: none"> • Delivery of corrosion control and coatings training to field- and depot-level workforce • Development of computer-based corrosion prevention design, management, and sustainment training for the acquisition workforce and facilities engineers • Validation of Cost of Corrosion data for Navy Surface Ships • Technical revisions to three corrosion-related military specifications <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> • Year two increment funding for FY 2021 long term Corrosion Demonstration/Validation Projects • Continue support for advanced research projects <p>FY 2023 Plans:</p> <p>Fund year 3 of 3 for the following projects:</p> <ul style="list-style-type: none"> •Gentoo Coating Application to HH-60G Tail Landing Gear Yoke to reduce corrosion inspection requirements and improve the durability of the yoke between inspection cycles; improving HH-60 readiness. <p>Fund years 3 and 4 for the following projects:</p> <ul style="list-style-type: none"> •Improved Landing Gear Durability for F/A-18E/F Super Hornet evaluating the application of multiple corrosion prevention technologies to improve the landing gear system to improve readiness and reduce cost. •Ship Class Topside Corrosion Control Configuration (CT3C) Implementation multiple corrosion prevention technologies to improve the improve ship operational sustainment and reduce cost <p>Initiate FY 2024 Demonstration and Implementation Project process; Initiate a CPC Test and Evaluation project or studies.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The FY 2022 Program Adjustment will result in a decrease in the investment in corrosion Demonstration/Validation Projects and Advanced Research projects.</p>			
Accomplishments/Planned Programs Subtotals		3.240	3.241
		FY 2021	FY 2022
Congressional Add: DoD Workforce Painter Training		2.000	0.000
FY 2021 Accomplishments: (1) Identified current best practices at various depots, (2) Identified parameters for various painter training methodologies utilized within DoD Depot environment(s),			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604016D8Z / <i>Department of Defense Corrosion Program</i>	Project (Number/Name) 015 / <i>Corrosion Protection Projects</i>

	FY 2021	FY 2022
(3) Identified painter training needs and gaps. Assessed multiple painter training methodologies and technologies,		
(4) Delivery of corrosion control and coatings training to field- and depot-level workforce		
FY 2022 Plans: • Deliver year 2 of 2 targeted corrosion control and coatings training to field- and depot-level workforce.		
• Conduct evaluation and qualitatively analyze impact training on various depot environments		
Congressional Adds Subtotals	2.000	0.000

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604016D8Z / <i>Department of Defense Corrosion Program</i>						Project (Number/Name) 015 / <i>Corrosion Protection Projects</i>			
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Corrosion Policy and Oversight	MIPR	Various (Army, Navy, Air Force) : Various	117.342	2.677	Oct 2021	0.565	Oct 2022	1.350	Oct 2023	-		1.350	Continuing	Continuing	-
Subtotal			117.342	2.677		0.565		1.350		-		1.350	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Research Studies	C/FFP	Various : Various	2.402	-		1.142	Sep 2022	0.100	Sep 2023	-		0.100	Continuing	Continuing	-
Technical Support	MIPR	Various (Army, Navy, Air Force) : Various	-	0.325	Jun 2021	0.158	Jun 2022	0.158	Jun 2023	-		0.158	Continuing	Continuing	-
Technical Support	Option/FFP	Leidos, Inc. : Virginia	0.496	-		-		-		-		-	Continuing	Continuing	-
Technical Support	C/FFP	Excet Inc. : Maryland	-	0.210	Jun 2021	0.221	Jun 2022	0.210	Jun 2023	-		0.210	Continuing	Continuing	-
Research Studies	MIPR	Various (Army, Navy, Air Force) : Various	-	-		-		0.292	Mar 2023	-		0.292	Continuing	Continuing	-
Subtotal			2.898	0.535		1.521		0.760		-		0.760	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Critical Compatibility Testing - COVID19 (FY20 Congressional-Add)	MIPR	Various (Army, Navy, Air Force) : Various	0.850	1.841	Jun 2021	-		-		-		-	Continuing	Continuing	-
Subtotal			0.850	1.841		-		-		-		-	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604016D8Z I Department of Defense Corrosion Program				Project (Number/Name) 015 I Corrosion Protection Projects					
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Corrosion Policy and Oversight	C/FFP	Logistics Management Institute : McLean, VA	23.194	0.000		0.956	Feb 2022	0.854	Feb 2023	-		0.854	Continuing	Continuing	-
Corrosion Policy and Oversight	Option/ FFP	LMI : McLean, VA	1.023	-		-		-		-		-	Continuing	Continuing	-
SBIR/STTR Funding	Allot	OSD : Virginia	-	0.123	Jun 2021	0.120	Jun 2022	0.123	Jun 2023	-		0.123	Continuing	Continuing	-
USD(A&S) Management Reserve	Allot	USD(A&S) : Virginia	-	0.064	Jun 2021	0.064	Jun 2022	0.064	Jun 2023	-		0.064	Continuing	Continuing	-
Corrosion Policy and Oversight Mgmt Services	Allot	Corrosion Policy and Oversight : Alexandria, VA	-	-		0.015	Oct 2022	0.015	Oct 2023	-		0.015	Continuing	Continuing	-
Subtotal			24.217	0.187		1.155		1.056		-		1.056	Continuing	Continuing	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			145.307	5.240		3.241		3.166		-		3.166	Continuing	Continuing	N/A
Remarks N/A															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense

Date: April 2022

Appropriation/Budget Activity

0400 / 4

R-1 Program Element (Number/Name)

PE 0604016D8Z / Department of Defense
Corrosion Program

Project (Number/Name)

015 / Corrosion Protection Projects

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Corrosion Protection Projects																												
Zinc-rich aerosol products for touch-up painting of steel substrates																												
Improved surface preparation and coatings for corrosion control of aluminum substrates																												
Pressure sensitive adhesive appliques for quick field repair of topcoat damage																												
Weld-through coatings for prevention of crevice corrosion in skip-welded joints																												
COVID-19 disinfectant material corrosion compatibility testing																												
Implementation of Zinc-Nickel (IZ-C17 +Zn-Ni) Electroplating as an Alternative to Cadmium																												
Gentoo™ Coating Application to HH-60G Tail Landing Gear Yoke																												
Improved Landing Gear Durability for F/A-18E/F Super Hornet																												
Ship Class Topside Corrosion Control Configuration (CT3C) Implementation																												
Environmentally Friendly Coating Assessment for Non-Immersed Marine Environment																												
Improving the accuracy of the algorithm for extracting corrosion information from maintenance data																												
Aircraft structural repair using additive manufacturing																												
Optimizing aircraft washdown intervals																												
Corrosion sensor development																												
Analytical corrosion prediction methods																												
Mitigation of biologically induced corrosion																												
Prediction of environmentally assisted cracking																												
DoD Workforce Painter Training																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604016D8Z / <i>Department of Defense Corrosion Program</i>	Project (Number/Name) 015 / <i>Corrosion Protection Projects</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Corrosion Policy and Oversight</i>				
Zinc-rich aerosol products for touch-up painting of steel substrates	3	2020	4	2021
Improved surface preparation and coatings for corrosion control of aluminum substrates	3	2020	4	2021
Pressure sensitive adhesive appliques for quick field repair of topcoat damage	3	2020	4	2021
Weld-through coatings for prevention of crevice corrosion in skip-welded joints	3	2020	4	2021
COVID-19 disinfectant material corrosion compatibility testing	2	2020	4	2021
Implementation of Zinc-Nickel (1Z-C17 +Zn-Ni) Electroplating as an Alternative to Cadmium	3	2016	4	2021
Gentoo™ Coating Application to HH-60G Tail Landing Gear Yoke	2	2021	1	2023
Improved Landing Gear Durability for F/A-18E/F Super Hornet	2	2021	4	2024
Ship Class Topside Corrosion Control Configuration (CT3C) Implementation	2	2021	4	2024
Environmentally Friendly Coating Assessment for Non-Immersed Marine Environment	2	2021	4	2022
Improving the accuracy of the algorithm for extracting corrosion information from maintenance data	1	2020	4	2020
Aircraft structural repair using additive manufacturing	4	2018	1	2023
Optimizing aircraft washdown intervals	4	2018	1	2021
Corrosion sensor development	4	2018	4	2020
Analytical corrosion prediction methods	4	2018	1	2023
Mitigation of biologically induced corrosion	4	2018	1	2023
Prediction of environmentally assisted cracking	4	2018	1	2022
DoD Workforce Painter Training	2	2020	4	2021

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0604124D8Z / Chief Digital Artificial Intelligence Officer							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	33.950	-	33.950	34.350	38.500	40.750	31.050	Continuing	Continuing
068: Intelligence Support	-	0.000	0.000	33.950	-	33.950	34.350	38.500	40.750	31.050	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to build enduring advantage and build a resilient Joint Force and defense ecosystem. On December 8, 2021, the Deputy Secretary of Defense (DSD) issued a memo establishing the Chief Digital and Artificial Intelligence Officer (CDAO) as the Department's senior official responsible for strengthening and integrating data, artificial intelligence, and digital solutions in the Department. The memorandum establishes the CDAO as the "successor organization to the Joint Artificial Intelligence Center (JAIC)". The CDAO reached Initial Operational Capacity (IOC) on February 1, 2022 and will integrate the JAIC, the Defense Digital Service (DDS), the Office of the Chief Data Officer (OCDO), and the Advancing Analytics (Advana) office from OUSD (Comptroller) as it approaches Full Operational Capacity (FOC) on June 1, 2022.

The integration of the JAIC, OCDO, DDS, and Advana into the CDAO more comprehensively restructures how the Department approaches the complex and dynamic challenges of becoming a digital, data, and Artificial Intelligence (AI) enabled enterprise capable of operating at the speed and scale necessary to accelerate the Department's adoption of data, analytics, and AI to preserve decision advantage.

The functions of the CDAO are as follows: lead and oversee DoD's strategy development and policy formulation for data, analytics, and AI; break down barriers to data and AI adoption within DoD institutional processes; create enabling digital infrastructure and services that support Components' development and deployment of data, analytics, AI, and digital-enabled solutions; selectively scale proven digital and AI-enabled solutions focused on enterprise and joint use cases; and surge digital services for rapid response to crises and emergent challenges. This also requires CDAO to integrate the capabilities, personnel, resources, and governance of its constituent organizations, while concurrently sustaining momentum on priority projects that align to CDAO's mission. These include expanding the enterprise data repository; establishing a responsible AI ecosystem; executing the AI and Data Accelerator (ADA) initiative; and developing a Data, Analytics, and AI Adoption Strategy. These various lines of effort will support the overarching mission of accelerating the Department's adoption of data, analytics, and AI to preserve decision advantage across the Joint Force.

The Department of Defense (DoD) and Intelligence Community (IC) Integration is chartered to create joint interoperability and leverage one another to harness and scale AI across the DoD. The organizational purpose is to improve coordination and interoperability between DoD and the IC, minimize duplication while maximizing a common approach, and develop an innovated joint AI operational concept and capability, where appropriate. This funding is assigned to support elements across three levels of effort: intelligence mission structure; compute and storage; and intelligence capabilities. Further details are classified and available upon request.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604124D8Z I <i>Chief Digital Artificial Intelligence Officer</i>
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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	33.950	-	33.950
Total Adjustments	0.000	0.000	33.950	-	33.950
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustment to Budget Year	-	-	33.950	-	33.950

Change Summary Explanation

On December 8, 2021, the DSD issued a memo establishing the CDAO as the Department's senior official responsible for strengthening and integrating data, artificial intelligence, and digital solutions in the Department. The memorandum establishes the CDAO as the "successor organization to the JAIC". The CDAO reached IOC on February 1, 2022 and will integrate the JAIC, the DDS, the OCDO, and Advana as it approaches FOC on June 1, 2022. The realignment of funding from the Under Secretary of Defense for Intelligence and Security (USDI&S) supports the consolidation of the Department's existing functional efforts in order to align manpower and funding under the OCDAO.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604124D8Z / <i>Chief Digital Artificial Intel ligence Officer</i>				Project (Number/Name) 068 / <i>Intelligence Support</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
068: <i>Intelligence Support</i>	-	0.000	0.000	33.950	-	33.950	34.350	38.500	40.750	31.050	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification
 The DoD and IC Integration is chartered to create joint interoperability and leverage one another to harness and scale AI across the DoD. The organizational purpose is to improve coordination and interoperability between DoD and the IC, minimize duplication while maximizing a common approach, and develop an innovated joint AI operational concept and capability, where appropriate. This funding is assigned to support elements across three levels of effort: intelligence mission structure; compute and storage; and intelligence capabilities. Further details are classified and available upon request.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Title: Project Maven Description: The DoD and IC Integration is chartered to create joint interoperability and leverage one another to harness and scale AI across the DoD. The organizational purpose is to improve coordination and interoperability between DoD and the IC, minimize duplication while maximizing a common approach, and develop an innovated joint AI operational concept and capability, where appropriate. This funding is assigned to support elements across three levels of effort: intelligence mission structure; compute and storage; and intelligence capabilities. Further details are classified and available upon request. FY 2023 Plans: FY23 plans are classified and available upon request. FY 2022 to FY 2023 Increase/Decrease Statement: Effective February 1, 2022 the DoD established the position of the CDAO and the OCDAO, tasked with serving as the Department's senior official, and a Principal Staff Assistant, responsible for strengthening and integrating data, artificial intelligence, and digital solutions. The realignment of funding from the USDI&S supports the consolidation of the Department's existing functional efforts in order to align manpower and funding under the OCDAO.	0.000	-	33.950
Accomplishments/Planned Programs Subtotals	0.000	-	33.950

C. Other Program Funding Summary (\$ in Millions)
 N/A

Remarks

D. Acquisition Strategy
 N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604124D8Z / <i>Chief Digital Artificial Intel</i>				Project (Number/Name) 068 / <i>Intelligence Support</i>					
Product Development (\$ in Millions)															
				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/Various	TBD : TBD	-	-		-		33.950		-		33.950	Continuing	Continuing	-
Subtotal			-	-		-		33.950		-		33.950	Continuing	Continuing	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-		-		33.950		-		33.950	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense										Date: April 2022			
Appropriation/Budget Activity					R-1 Program Element (Number/Name)					Project (Number/Name)			
0400 / 4					PE 0604124D8Z / Chief Digital Artificial Intel ligence Officer					068 / Intelligence Support			

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Project Maven																												
Project Maven																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604124D8Z / Chief Digital Artificial Intel ligence Officer	Project (Number/Name) 068 / Intelligence Support	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Project Maven				
Project Maven	4	2022	3	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)	PE 0604250D8Z / Advanced Innovative Technologies											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	5,108.455	732.208	777.199	1,145.358	0.000	1,145.358	1,036.754	776.342	520.515	518.734	Continuing	Continuing
250: Advanced Innovative Technologies	5,108.455	732.208	777.199	1,145.358	0.000	1,145.358	1,036.754	776.342	520.515	518.734	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Strategic Capabilities Office (SCO) develops, demonstrates, and transitions game-changing capabilities to shape and counter emerging threats and increase the lethality of the Joint Force in contested environments. The SCO combines capability innovation with concepts of operation to develop novel concepts solving critical national security challenges in partnership with the Services, Defense Agencies, Combatant Commands (CCMDS), Joint Chiefs of Staff, Intelligence Community, and the Office of the Secretary of Defense (OSD).

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	749.030	716.456	0.000	0.000	0.000
Current President's Budget	732.208	777.199	1,145.358	0.000	1,145.358
Total Adjustments	-16.822	60.743	1,145.358	0.000	1,145.358
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	63.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.145	-			
• SBIR/STTR Transfer	-16.677	-			
• Adjustments to Budget Year	-	-	1,145.358	-	1,145.358
• FFRDC Reduction	-	-2.257	-	-	-

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 250: Advanced Innovative Technologies

Congressional Add: Micro Nuclear Reactor Program (Pele)

Congressional Add: Predictive Autonomous Navigational Routing System Phase II

Congressional Add Subtotals for Project: 250

Congressional Add Totals for all Projects

FY 2021	FY 2022
70.000	60.000
-	3.000
70.000	63.000
70.000	63.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> / BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 0604250D8Z / <i>Advanced Innovative Technologies</i>
<u>Change Summary Explanation</u> FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.		

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604250D8Z / Advanced Innovative Technologies				Project (Number/Name) 250 / Advanced Innovative Technologies			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
250: Advanced Innovative Technologies	5,108.455	732.208	777.199	1,145.358	0.000	1,145.358	1,036.754	776.342	520.515	518.734	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Strategic Capabilities Office (SCO) develops, demonstrates, and transitions game-changing capabilities to shape and counter emerging threats and increase the lethality of the Joint Force in contested environments. The SCO combines capability innovation with concepts of operation and information management to develop novel concepts solving critical national security challenges in partnership with the Services, Defense Agencies, Combatant Commands (CCMDS), Joint Chiefs of Staff, Intelligence Community, and the Office of the Secretary of Defense (OSD).

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Alternate Strike	20.011	-	-
Description: The Alternate Strike project demonstrates feasibility and utility of launching existing/modified weapons from existing launch platforms. This project will retire risks associated with cross platform integration to enable transition of new weapon/ system combinations to Service partners. This project was completed in FY 2021.			
Title: ARCADE	-	-	12.100
Description: Due to the classified nature of this project, specific applications and details are available at a higher classification level.			
FY 2023 Plans: Due to the classified nature of this project, specific applications and details are available at a higher classification level.			
FY 2022 to FY 2023 Increase/Decrease Statement: Arcade enters the prototyping phase in FY2023.			
Title: Aurora	17.511	17.589	-
Description: The Aurora project provides mission planning and execution aids to support fleet operations. Specific applications and detailed plans are available at a higher classification level.			
FY 2022 Plans: Due to the classified nature of this project, specific applications and details are available at a higher classification level.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604250D8Z / Advanced Innovative Technologies	Project (Number/Name) 250 / Advanced Innovative Technologies		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
The change is due to completion of the project.				
Title: Avatar Description: The Avatar project develops enhanced manned-unmanned capabilities. Due to the nature of this project, specific applications and detailed plans are available at a higher classification level. FY 2022 Plans: Due to the classified nature of this project, specific applications and details are available at a higher classification level. FY 2023 Plans: Due to the nature of this project, specific applications and detailed plans are available at a higher classification level. FY 2022 to FY 2023 Increase/Decrease Statement: The decrease is consistent with the planned project phasing which is available at higher classification levels.		30.606	53.416	6.000
Title: Bedlam Description: Due to the classified nature of this project, specific applications and details are available at a higher classification level. FY 2023 Plans: Due to the classified nature of this project, specific applications and details are available at a higher classification level. FY 2022 to FY 2023 Increase/Decrease Statement: Bedlam enters the prototyping phase in FY2023.		-	-	9.500
Title: Breaker Description: The Breaker demonstration provides Combatant Commanders with long range effects against targets. Due to the nature of these projects, specific applications and detailed plans are available at a higher classification level. The project was completed in FY 2021.		0.235	-	-
Title: Carnac Description: The Carnac project applies machine learning algorithms and techniques to existing sensors in order to reduce operator workload and data throughput requirements. Due to the nature of this project, specific applications and detailed plans are available at a higher classification. The project was completed in FY 2021.		13.600	-	-
Title: Classified Projects		331.969	370.011	644.620

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604250D8Z / Advanced Innovative Technologies	Project (Number/Name) 250 / Advanced Innovative Technologies		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Description: Due to the classified nature of these projects, specific applications and details are available at a higher classification level. FY 2022 Plans: Due to the classified nature of these projects, specific applications and details are available at a higher classification level. FY 2023 Plans: Due to the classified nature of these projects, specific applications and details are available at a higher classification level. FY 2022 to FY 2023 Increase/Decrease Statement: The increase is consistent with the planned projects phasing which are available at higher classification levels.				
Title: Contender Description: SCO will develop and demonstrate an operational prototype that will enable more capable weapons system. Due to the nature of this project, specific applications and detailed plans are available at a higher classification level. This project was completed in FY 2021.		0.485	-	-
Title: Eclipse Description: The Eclipse project accelerates the maturation and fielding of emerging disruptive technologies. Specific applications and detailed plans are available at a higher classification level. FY 2022 Plans: Due to the classified nature of this project, specific applications and details are available at a higher classification level. FY 2023 Plans: Due to the classified nature of this project, specific applications and details are available at a higher classification level. FY 2022 to FY 2023 Increase/Decrease Statement: The decrease is consistent with the planned project phasing which is available at higher classification levels.		11.663	25.300	7.000
Title: Emerging Opportunities Description: Implementation of small new capabilities or augmentations as a result of latest intelligence and threats analysis. FY 2023 Plans: Opportunities will be selected during the execution year. FY 2022 to FY 2023 Increase/Decrease Statement:		-	-	7.800

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604250D8Z / <i>Advanced Innovative Technologies</i>	Project (Number/Name) 250 / <i>Advanced Innovative Technologies</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Emerging Opportunities is a new activity in FY2023.				
Title: Ghost Fleet Description: SCO will develop and demonstrate fleet integrated, operational prototype unmanned maritime vehicles to fill existing mission requirements for Combatant Commanders. Due to the classified nature of this project, specific applications and details are available at a higher classification level. This project was completed in FY 2021.		28.251	-	-
Title: Hoover Description: The Hoover project applies machine learning algorithms and techniques in order to reduce operator workload and data throughput requirements. Due to the classified nature of this project, specific applications and detailed plans are available at a higher classification. FY 2022 Plans: <ul style="list-style-type: none">• Incorporate feedback from FY 2021 demonstration events• Conduct additional prototype demonstration tests• Continued refinement of machine learning algorithms FY 2022 to FY 2023 Increase/Decrease Statement: The decrease is due to planned completion of the project.		53.626	32.030	-
Title: Hurt Locker Description: The Hurt Locker project demonstrates feasibility and utility of alternative system deployment. This program will retire risks associated with cross platform integration of existing weapons control systems. Due to the nature of this project, specific applications and detailed plans are available at a higher classification. FY 2022 Plans: Due to the classified nature of this project, specific applications and details are available at a higher classification level. FY 2023 Plans: Due to the classified nature of this project, specific applications and details are available at a higher classification level. FY 2022 to FY 2023 Increase/Decrease Statement: The increase is consistent with the planned project phasing which is available at higher classification levels.		31.016	13.500	48.500
Title: Hypervelocity Gun Weapon System (HGWS)		3.000	20.000	151.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604250D8Z / Advanced Innovative Technologies	Project (Number/Name) 250 / Advanced Innovative Technologies		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Description: Cost-effective, large magazine point defense will be demonstrated by closing the fire control loop between existing sensors and prototype projectiles launched from existing families of powder guns. Due to the nature of this project, specific applications and detailed plans are available at a higher classification level.</p> <p>FY 2022 Plans: The HGWS project will support Pre-Engineering & Manufacturing Development (EMD) activities for the radar, gun, fire direction, and projectile related to transition efforts.</p> <p>FY 2023 Plans: The HGWS project will support initiation of the Engineering & Manufacturing Development (EMD) phase in preparation for transition efforts.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The increase supports initiation of the EMD phase.</p>				
<p>Title: IKE</p> <p>Description: The Ike program provides a joint cyber platform. Specific applications and detailed plans are available at a higher classification level. Ike transitioned to the Joint Cyber Command and Control (JCC2) program management office in FY 2021.</p>		30.600	-	-
<p>Title: LiTE Saber</p> <p>Description: The LiTE Saber project will develop and demonstrate a ubiquitous tactical command, control and communication capability in relevant combat environments. Due to the classified nature of this project, specific applications and detailed plans are available at a higher classification. This project was completed in FY 2021.</p>		10.964	-	-
<p>Title: Mission Support</p> <p>Description: These funds provide management and administrative support costs for the Strategic Capabilities Office. These costs include reimbursable personnel funding, building rent, physical security, travel, supplies and equipment, information technology, contractor support (Systems Engineering and Technical Assistance (SETA)), and the SBIR/STTR assessment (FY21 number is reduced for executed SBIR/STTR budget transfer).</p> <p>FY 2022 Plans:</p>		31.439	57.935	78.988

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>These funds provide management and administrative support costs for the Strategic Capabilities Office. These costs include reimbursable personnel funding, building rent, physical security, travel, supplies and equipment, information technology, contractor support (Systems Engineering and Technical Assistance (SETA)). This also includes required funding for SBIR/STTR.</p> <p>FY 2023 Plans: These funds provide management and administrative support costs for the Strategic Capabilities Office. These costs include reimbursable personnel funding, building rent, physical security, travel, supplies and equipment, information technology, contractor support (Systems Engineering and Technical Assistance (SETA)). This also includes required funding for SBIR/STTR.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The increase is due to cost growth of the support services provided to the projects, and the increased SBIR/STTR budget for the higher extramural R&D budget.</p>			
<p>Title: Pele</p> <p>Description: Develop a prototype transportable nuclear microreactor to be demonstrated by FY 2025 that can generate 1-5 MW of electric power, is transportable in standard shipping containers, and meets safety, legal, and regulatory requirements to minimize risk of radiation exposure, nuclear proliferation, and environmental impact. In addition, testing, modeling, and analysis will be performed to prepare for future service transition decisions.</p> <p>FY 2022 Plans: The Pele project will complete the design phase, which includes materials testing, leading to a final down-select to one reactor design. The NEPA Final Environmental Impact Statement (EIS) will be completed, with a Record of Decision (ROD) made. Preliminary safety and design analysis will be performed by the Department of Energy. Modeling will be performed to study the survivability of the designs under adverse conditions, including kinetic. Specific applications and details are available at a higher classification level.</p> <p>FY 2023 Plans: Subject to the conclusion of the NEPA EIS process with a ROD selecting the proposed action, the Pele project will begin construction of the prototype transportable nuclear microreactor. Additional work will be performed by the Department of Energy toward a Final Documented Safety Analysis. Pele will also begin fabrication of the HALEU TRISO pellets and compacts for the reactor core, and will prepare those compacts for shipment to the assembly site, including regulatory approval. The project will support the winning vendor in seeking regulatory approval for U.S. highway transportation of the post-operation reactor. Survivability testing will be performed with sub-scale models in order to validate modeling. Operational doctrine and training</p>		-	57.000
			130.500

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0604250D8Z / <i>Advanced Innovative Technologies</i>		Project (Number/Name) 250 / <i>Advanced Innovative Technologies</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
concepts will be studied and developed in order to inform a future service transition. Specific applications and details are available at a higher classification level.					
FY 2022 to FY 2023 Increase/Decrease Statement: The increase is a result of completing the final design phase and taking the necessary regulatory and environmental review steps in preparation for construction.					
Title: Point Break Description: Due to the classified nature of this project, specific applications and details are available at a higher classification level. Point Break started in FY 2022. FY 2022 Plans: Due to the classified nature of this project, specific applications and details are available at a higher classification level. FY 2023 Plans: Due to the classified nature of this project, specific applications and details are available at a higher classification level. FY 2022 to FY 2023 Increase/Decrease Statement: The increase is consistent with the planned project phasing which is available at higher classification levels.			-	28.600	41.700
Title: Quiet Riot Description: The Quiet Riot project will leverage previous investments to demonstrate the feasibility of providing Combatant Commanders additional options. Due to the classified nature of this project, specific applications and detailed plans are available at a higher classification. FY 2022 Plans: • Perform test & evaluation to determine technical and operational effectiveness FY 2022 to FY 2023 Increase/Decrease Statement: The decrease is due to completion of the project.			-	8.018	-
Title: Sea Dragon Description: A cost-effective capability will be demonstrated by integrating an existing weapon system with an existing platform. Due to the classified nature of this project, specific applications and detailed plans are available at a higher classification level. This project was completed in FY 2021.			5.190	-	-
Title: Sea Stalker			3.295	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604250D8Z / <i>Advanced Innovative Technologies</i>	Project (Number/Name) 250 / <i>Advanced Innovative Technologies</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
FY 2023			
Description: The Sea Stalker will leverage existing low-cost, persistent maritime platforms to offer Combatant Commanders immediate options. Due to the classified nature of this project, specific applications and detailed plans are available at a higher classification level. This project was completed in FY 2021.			
Title: Serenity Description: The Serenity project will leverage existing technologies to analyze and demonstrate a prototype solution to ensure survivability of U.S. assets. Due to the classified nature of this project, specific applications and detailed plans are available at a higher classification level. This project was completed in FY 2021.		0.660	-
Title: Shawshank Description: The Shawshank program provides Special Operations Forces new and enhanced capabilities. Specific applications and detailed plans are available at a higher classification level. FY 2022 Plans: Due to the classified nature of this project, specific applications and details are available at a higher classification level. FY 2023 Plans: Due to the classified nature of this project, specific applications and details are available at a higher classification level. FY 2022 to FY 2023 Increase/Decrease Statement: The decrease is consistent with the planned project phasing which is available at higher classification levels.		33.426	30.800
Title: StormSystem Description: StormSystem will leverage existing capabilities to develop a suite of tools that disrupts the adversary cyber capabilities. Due to the classified nature of this project, specific applications and detailed plans are available at a higher classification level. This project was completed in FY 2021.		2.445	-
Title: Wildcat Description: The Wildcat project will demonstrate the feasibility and operational utility of enhanced weapon capability. Due to the classified nature of this project, specific applications and detailed plans are available at a higher classification. This project was completed in FY 2021.		2.216	-
Accomplishments/Planned Programs Subtotals		662.208	714.199
			1,145.358

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604250D8Z / <i>Advanced Innovative Technologies</i>	Project (Number/Name) 250 / <i>Advanced Innovative Technologies</i>	
		FY 2021	FY 2022
Congressional Add: Micro Nuclear Reactor Program (Pele) FY 2021 Accomplishments: Completed three preliminary engineering designs ("50% designs"), and selected two of the three teams to develop final engineering designs, which will be completed in FY22. Drafted the Pele Safety Design Strategy (SDS) which was approved by the Department of Energy, and began drafting the Preliminary Design Safety Analysis (PDSA). Completed the Draft Environmental Impact Statement in accordance with the National Environmental Policy Act (NEPA), released it to the public, and held two public hearings on potential public impacts of the Pele microreactor. FY 2022 and FY 2023 Plans are shown under Project Pele above. FY 2022 Plans: FY 2022 and FY 2023 Plans are shown under Project Pele above.		70.000	60.000
Congressional Add: Predictive Autonomous Navigational Routing System Phase II FY 2022 Plans: Seaman's Eye is developing a prototype of an affordable system to assess the wave and wind environment for an unmanned surface vessel (USV) platform using a fusion of passive sensors, physics-based modeling, and artificial intelligence. The system will support autonomous mission and navigation planning and will provide distributed sensing of the ocean environment to remote users.		-	3.000
Congressional Adds Subtotals		70.000	63.000
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604250D8Z / <i>Advanced Innovative Technologies</i>						Project (Number/Name) 250 / <i>Advanced Innovative Technologies</i>			
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Alternate Strike	Various	Various : Various	439.669	20.011		-		-		-		-	0.000	459.680	-
ARCADE	Various	Various : Various	-	-		-		12.100		-		12.100	23.900	36.000	-
Aurora	Various	Various : Various	18.000	17.511		17.589		-		-		-	0.000	53.100	-
Avatar	Various	Various : Various	187.777	30.606		53.416		6.000		-		6.000	0.000	277.799	-
Bedlam	Various	Various : Various	-	-		-		9.500		-		9.500	26.500	36.000	-
Breaker	Various	Various : Various	64.328	0.235		-		-		-		-	0.000	64.563	-
Carnac	Various	Various : Various	40.592	13.600		-		-		-		-	0.000	54.192	-
Classified Projects	Various	Various : Various	89.212	331.969		370.011		644.620		-		644.620	Continuing	Continuing	-
Contender	Various	Various : Various	262.630	0.485		-		-		-		-	0.000	263.115	-
Eclipse	Various	Various : Various	29.378	11.663		25.300		7.000		-		7.000	0.000	73.341	-
Emerging Opportunities	Various	Various : Various	-	-		-		7.800		-		7.800	Continuing	Continuing	-
Ghost Fleet	Various	Various : Various	346.441	28.251		-		-		-		-	0.000	374.692	-
Hoover	Various	Various : Various	181.255	53.626		32.030		-		-		-	0.000	266.911	-
Hurt Locker	Various	Various : Various	145.285	31.016		13.500		48.500		-		48.500	0.000	238.301	-
HGWS	Various	Various : Various	772.611	3.000		20.000		151.000		-		151.000	347.000	1,293.611	-
IKE	Various	Various : Various	-	30.600		-		-		-		-	0.000	30.600	-
LiTE Saber	Various	Various : Various	160.284	10.964		-		-		-		-	0.000	171.248	-
Mission Support	Various	Various : Various	74.755	31.439		57.935		78.988		-		78.988	Continuing	Continuing	-
Pele	Various	Various : Various	63.000	70.000		117.000		130.500		-		130.500	80.500	461.000	-
Point Break	Various	Various : Various	-	-		28.600		41.700		-		41.700	13.800	84.100	-
Quiet Riot	Various	Various : Various	19.475	-		8.018		-		-		-	0.000	27.493	-
Sea Dragon	Various	Various : Various	743.489	5.190		-		-		-		-	0.000	748.679	-
Sea Stalker	Various	Various : Various	75.670	3.295		-		-		-		-	0.000	78.965	-
Serenity	Various	Various : Various	42.810	0.660		-		-		-		-	0.000	43.470	-
Shawshank	Various	Various : Various	122.980	33.426		30.800		7.650		-		7.650	0.000	194.856	-
StormSystem	Various	Various : Various	41.539	2.445		-		-		-		-	0.000	43.984	-
Wildcat	Various	Various : Various	141.576	2.216		-		-		-		-	0.000	143.792	-
Completed Projects	Various	Various : Various	1,045.699	-		-		-		-		-	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604250D8Z / <i>Advanced Innovative Technologies</i>						Project (Number/Name) 250 / <i>Advanced Innovative Technologies</i>			
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Predictive Autonomous Navigational Routing System Phase II	Various	Various : Various	-	-		3.000		-		-		-	0.000	3.000	-
Subtotal			5,108.455	732.208		777.199		1,145.358		-		1,145.358	Continuing	Continuing	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			5,108.455	732.208		777.199		1,145.358		-		1,145.358	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604250D8Z / <i>Advanced Innovative Technologies</i>					Project (Number/Name) 250 / <i>Advanced Innovative Technologies</i>		

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Alternative Strike																												
Product Development																												
ARCADE																												
Product Development																												
Aurora																												
Product Development																												
Avatar																												
Product Development																												
Bedlam																												
Product Development																												
Breaker																												
Product Development																												
Carnac																												
Product Development																												
Classified Projects																												
Product Development																												
Contender																												
Product Development																												
Eclipse																												
Product Development																												
Emerging Opportunities																												
Product Development																												
Ghost Fleet																												
Product Development																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense

Date: April 2022

Appropriation/Budget Activity

0400 / 4

R-1 Program Element (Number/Name)

PE 0604250D8Z / *Advanced Innovative Technologies*

Project (Number/Name)

250 / Advanced Innovative Technologies

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Hoover																												
Product Development																												
Hurt Locker																												
Product Development																												
Hypervelocity Gun Weapons System (HGWS)																												
Product Development																												
IKE																												
Product Development																												
LiTE Saber																												
Product Development																												
Pele																												
Product Development																												
Point Break																												
Product Development																												
Quiet Riot																												
Product Development																												
Sea Dragon																												
Product Development																												
Sea Stalker																												
Product Development																												
Serenity																												
Product Development																												
Shawshank																												
Product Development																												
StormSystem																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense																								Date: April 2022													
Appropriation/Budget Activity 0400 / 4										R-1 Program Element (Number/Name) PE 0604250D8Z / Advanced Innovative Technologies										Project (Number/Name) 250 / Advanced Innovative Technologies																	
										FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
										1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
Product Development																																					
Wildcat																																					
Product Development																																					

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604250D8Z / Advanced Innovative Technologies	Project (Number/Name) 250 / Advanced Innovative Technologies	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Alternative Strike				
Product Development	1	2021	4	2022
ARCADE				
Product Development	1	2023	4	2026
Aurora				
Product Development	1	2021	4	2023
Avatar				
Product Development	1	2021	4	2024
Bedlam				
Product Development	1	2023	4	2026
Breaker				
Product Development	1	2021	4	2022
Carnac				
Product Development	1	2021	4	2022
Classified Projects				
Product Development	1	2021	4	2027
Contender				
Product Development	1	2021	4	2022
Eclipse				
Product Development	1	2021	4	2024
Emerging Opportunities				
Product Development	1	2023	4	2027

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense				Date: April 2022	
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0604250D8Z / <i>Advanced Innovative Technologies</i>		Project (Number/Name) 250 / <i>Advanced Innovative Technologies</i>	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
<i>Ghost Fleet</i>					
Product Development		1	2021	4	2022
<i>Hoover</i>					
Product Development		1	2021	4	2023
<i>Hurt Locker</i>					
Product Development		1	2021	4	2024
<i>Hypervelocity Gun Weapons System (HGWS)</i>					
Product Development		1	2021	4	2026
<i>IKE</i>					
Product Development		1	2021	4	2021
<i>LiTE Saber</i>					
Product Development		1	2021	4	2022
<i>Pele</i>					
Product Development		1	2021	4	2026
<i>Point Break</i>					
Product Development		1	2022	4	2025
<i>Quiet Riot</i>					
Product Development		1	2021	4	2023
<i>Sea Dragon</i>					
Product Development		1	2021	4	2022
<i>Sea Stalker</i>					
Product Development		1	2021	4	2022
<i>Serenity</i>					
Product Development		1	2021	4	2022
<i>Shawshank</i>					

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense

Date: April 2022

Appropriation/Budget Activity

0400 / 4

R-1 Program Element (Number/Name)

PE 0604250D8Z / *Advanced Innovative Technologies*

Project (Number/Name)

250 / *Advanced Innovative Technologies*

	Start		End	
Events by Sub Project	Quarter	Year	Quarter	Year
Product Development	1	2021	4	2024
StormSystem				
Product Development	1	2021	4	2022
Wildcat				
Product Development	1	2021	4	2022

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0604294D8Z / Trusted and Assured Microelectronics							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	1,199.177	489.251	704.091	647.226	0.000	647.226	662.282	584.378	575.319	547.581	Continuing	Continuing
907: Access to State-of-the-Art (SOTA) Microelectronics - Development	1,199.177	281.769	395.976	362.558	0.000	362.558	313.905	280.511	276.170	262.858	Continuing	Continuing
908: Access to Advanced Packaging and Testing - Development	0.000	81.438	112.343	56.118	0.000	56.118	0.000	0.000	0.000	0.000	Continuing	Continuing
911: Address DoD Unique Needs - Radiation Hardening and non-CMOS	0.000	50.500	169.072	107.003	0.000	107.003	154.852	136.718	134.642	128.150	Continuing	Continuing
912: Create a Quantifiably Assured-Microelectronics Pipeline	0.000	75.544	26.700	113.547	0.000	113.547	189.525	167.149	164.507	156.573	Continuing	Continuing
913: Defense Microelectronics Cross-Functional Team Funding	-	0.000	0.000	8.000	-	8.000	4.000	0.000	0.000	0.000	Continuing	Continuing

Note

New Start (Y/N): No

Beginning in FY 2021 Program Element (PE) funding was realigned under four new project codes to correctly align PE funding in support of the Quantifiable Assurance method and reflective of current priorities. The new project codes are: (1) P907 Access to State-of-the-Art (SOTA) Microelectronics - Development; (2) P908 Access to Advanced Packaging and Testing - Development; (3) P911 Address the Department of Defense (DoD) Unique Needs - Radiation Hardening and non-CMOS - Development; and (4) P912 Create a Quantifiably-Assured Microelectronics Pipeline. The prior year funding project codes did not continue after FY 2020 though the overarching goals of the program element are the same. The four new project codes refocus the PE and provide traceability to the current enhancement priorities of SOTA access, advanced heterogeneous integration and packaging, DoD unique needs, and quantifiable assurance throughout the microelectronics pipeline.

A. Mission Description and Budget Item Justification

This Program Element (PE) supports microelectronics modernization activities that enable defense systems to keep pace with commercial microelectronics technological advances, reduce reliance on obsolete microelectronics, and mitigate the Department's reliance on sole source foundries for assured state-of-the-art (SOTA) microelectronics. It addresses the challenges of 1) having enduring access to a multiplicity of modern manufacturing processes that require commercial volumes to maintain long term viability and 2) protecting the intellectual property (IP) of the microelectronic parts that are manufactured.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604294D8Z <i>I Trusted and Assured Microelectronics</i>
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This PE supports the National Defense Strategy's (NDS) for 2018 line of effort to build a more lethal force through modernization of key capabilities, the NDS defense objective of establishing an unmatched twenty-first century National Security Innovation Base that effectively supports Department operations and sustains security and solvency, and the NDS strategic approach of reforming the Department's business practices by simultaneously increasing performance and affordability while still minimizing risk.

This PE supports the OUSD(R&E) Microelectronics Modernization Roadmap. The primary areas of focus of this roadmap include the following: access to state-of-the-art microelectronics technology, access to advanced packaging and test; access to the best commercial design technology; quantifiable assurance and secure design; foundry access; policies, standards, and Joint Federated Assurance Center (JFAC) governing body; access to radiation hardened microelectronics; access to non-complementary metal oxide semiconductor state-of-the-art (SOTA) microelectronics for radio frequency and optoelectronic applications; education and workforce development; and supply chain awareness and security.

Recognizing that an assured supply of microelectronics is a U.S. Government (USG)-wide concern, this activity will interface with interagency partners to take into account interagency requirements, opportunities for collaboration, and strategic decisions that can be made to limit the overall cost of these requirements to the USG.

This activity is being led by the Under Secretary of Defense for Research and Engineering.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	489.251	509.195	0.000	0.000	0.000
Current President's Budget	489.251	704.091	647.226	0.000	647.226
Total Adjustments	0.000	194.896	647.226	0.000	647.226
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	196.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• FFRDC	-	-1.604	-25.430	-	-25.430
• Adjustments to Budget Year	-	-	324.569	-	324.569
• Economic Assumption	-	-	10.937	-	10.937
• Microelectronics Ecosystem	-	-	329.150	-	329.150
• Defense Microelectronics Cross-Functional Team Funding	-	-	8.000	-	8.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 0604294D8Z <i>I Trusted and Assured Microelectronics</i>	
<u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u>		FY 2021	FY 2022
Project: 907: <i>Access to State-of-the-Art (SOTA) Microelectronics - Development</i>			
Congressional Add: <i>Design Acceleration</i>		-	100.000
Congressional Add Subtotals for Project: 907		-	100.000
Project: 911: <i>Address DoD Unique Needs - Radiation Hardening and non-CMOS</i>			
Congressional Add: <i>GaN and GaAs RFIC technology</i>		10.000	25.000
Congressional Add: <i>Radiation-Hardened Fully-Depleted Silicon-on-Insulator Microelectronics</i>		-	18.000
Congressional Add: <i>Advanced Node Radiation-Hardened Fully-Depleted Silicon-on-Insulator Technology</i>		-	43.500
Congressional Add Subtotals for Project: 911		10.000	86.500
Project: 912: <i>Create a Quantifiably Assured-Microelectronics Pipeline</i>			
Congressional Add: <i>Trusted Artificial Intelligence</i>		5.000	10.000
Congressional Add Subtotals for Project: 912		5.000	10.000
Congressional Add Totals for all Projects		15.000	196.500
<u>Change Summary Explanation</u>			
A Congressional rescission of \$14.451 million was enacted as part of the FY 2022 Appropriation reducing the available FY 2021 budget to \$474.800 million.			
FY 2022 Appropriation increased in the amount of \$196.500 million for the following efforts:			
o \$18.000 million - radiation-hardened fully-depleted silicon-on insulator microelectronics			
o \$25.000 million - GaN and GaAs RFIC technology			
o \$43.500 million - advanced node radiation-hardened fully depleted silicon-on-insulator technology			
o \$10.000 million - trusted artificial intelligence			
o \$100.000 million - design acceleration			
FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.			
The FY 2023 funding request was reduced by \$25.430 million to account for the availability of prior year execution balances.			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>				Project (Number/Name) 907 / <i>Access to State-of-the-Art (SOTA) Microelectronics - Development</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
907: <i>Access to State-of-the-Art (SOTA) Microelectronics - Development</i>	1,199.177	281.769	395.976	362.558	0.000	362.558	313.905	280.511	276.170	262.858	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Microelectronics are critical technologies that drive the modern economy and enable the defense systems that allow warfighters to accomplish their missions. Other nations recognize the need to control the microelectronics supply chain and indigenous state-of-the-art (SOTA) manufacturing. Aggressive investments and licit and illicit actions by peer nations threaten U.S. leadership. China alone purports investment of \$150 billion and a national strategy to achieve dominance in all major areas of microelectronics by 2030. Russia and China have publicly stated that advanced microelectronics, AI, and machine learning (ML) are the keys to economic and military dominance.

This project funds the operation software and hardware assurance (SwA and HwA) support to DoD programs and organizations of the Joint Federated Assurance Center (JFAC), established in National Defense Authorization Act (NDAA) Sec 937, to increase DoD's SwA and HwA by providing engineering tools, technical services, best-practices, innovative technologies and other assistance to programs to detect, assess, prioritize, and mitigate vulnerabilities from malicious software and hardware attacks and assurance against supply chain exploitation vulnerabilities. The JFAC will provide capabilities for programs to keep assessment findings throughout the life cycle of their systems for data mining (e.g., documentation on rationale for previous mitigation decisions). The collaboration between the JFAC and program offices will help mitigate existing and emerging critical threats and vulnerabilities in software and hardware available to all DoD programs.

The project supports the implementation of Executive Order 14028 Improving the Nation's Cybersecurity for software assurance for critical software such as software bill of materials, and information communications technology supply chain risk management, and the PD, Cyber Roadmap for mitigation of software vulnerabilities that are cyber related.

This project includes establishment of new strategic partnerships with existing commercial state-of-the-art (SOTA) domestic foundries to develop a data-driven, risk-based approach to supply chain protection and develop the assured access, secure design, and manufacture of advanced microelectronics technology and electronic components.

Successful implementation will transition these technologies to use in DoD programs, obtain access to multiple commercial microelectronics facilities, establish secure design capabilities, and solidify a data-driven approach to supply chain protection. It also includes keeping pace with the rapid advancements in microelectronics technology and the globalization of this industry sector. It will provide the basics for updating and strengthening DoD assurance policy and includes collaborating with industry to develop data driven quantifiable standards.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 907 / <i>Access to State-of-the-Art (SOTA) Microelectronics - Development</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
Title: Joint Federated Assurance Center (JFAC)		8.810	9.000
Description: This project's activities will enhance the use of hardware and software tools, techniques, and assurance methodology directly with programs and organizations, throughout DoD and the life cycle. JFAC provides a common forum in DoD for assurance best practices, training, community dialog on assurance, access to new technology, collaboration with other components of USG, and tools usable by programs for maintaining quantifiable assurance data.			10.820
FY 2022 Plans:			
<ul style="list-style-type: none"> • Select and procure quantities of state-of-the-art software assurance (SwA) tools; innovate and advance technology for vulnerability and subverted code detection of binary code in DoD embedded systems; evaluate high payoff open source components required to move DoD systems to the cloud using containers; technology and infrastructure support to programs to determine and mitigate exploitable vulnerabilities; map vulnerabilities and threats to SwA tool capabilities and provide assessments of how well SwA tools and techniques function directly to programs. • Execute enterprise license program procurement of SwA tools. • Continue to align JFAC infrastructure cloud native environments to support hardware assurance, deploy SwA tools, training, shared experiences, and best tool-use practice directly to programs and organizations. . • Develop and make directly available to programs and organizations software vulnerability mitigations, standards and technical implementation guidance, training packages, and subject matter expertise. •Continue efforts to support implementation of Executive Order 14028 Improving the Nation's Cybersecurity for software assurance for critical software, and the software bill of materials. •Refine implementation of FY2019 NDAA Section 1655 - Mitigation of risks to national security posed by providers of information technology products and services who have obligations to foreign governments 			
FY 2023 Plans:			
<ul style="list-style-type: none"> •Continue to Select and procure quantities of state-of-the-art software assurance (SwA) tools; innovate and advance technology for vulnerability and subverted code detection of binary code in DoD embedded systems; evaluate high payoff open source components required to move DoD systems to the cloud using containers; technology and infrastructure support to programs to determine and mitigate exploitable vulnerabilities; map vulnerabilities and threats to SwA tool capabilities and provide assessments of how well SwA tools and techniques function directly to programs. • Execute enterprise license program procurement of SwA tools. • Continue to align expanding JFAC infrastructure to cloud native environments to support hardware assurance, deploy SwA tools, training, shared experiences, and best tool-use practice directly to programs and organizations. • Develop and make directly available to programs and organizations beyond leading edge acquisition software vulnerability mitigations, standards and technical implementation guidance, workforce training packages, and subject matter expertise. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>		Project (Number/Name) 907 / <i>Access to State-of-the-Art (SOTA) Microelectronics - Development</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> Continue efforts to support implementation of Executive Order 14028 Improving the Nation's Cybersecurity for software assurance for critical software, and the software bill of materials. Continue to implement FY2019 NDAA Section 1655 - Mitigation of risks to national security posed by providers of information technology products and services who have obligations to foreign governments <p>FY 2022 to FY 2023 Increase/Decrease Statement: Changes reflect minor budget fluctuations.</p>					
<p>Title: Design</p> <p>Description: The enhancement will develop quantifiably assured design concepts in manufactured systems, access to advanced state-of-the-art technology through secure design centers, enabling a formal risk-based approach to protection techniques. Manufactured microelectronics will be tested to ensure that intellectual property (IP) protections meet or exceed current National Security Agency standards for IP protection, and to demonstrate DoD's ability to detect certain malicious supply chain attacks on DoD microelectronics.</p> <p>Successful implementation will continue to transition these technologies to use in DoD programs and maintain access to multiple (2) commercial microelectronics facilities, and solidify a data-driven approach to supply chain protection.</p> <p>FY 2022 Plans: These efforts are being merged into a combined program for both secure design and quantifiable assurance activities beginning with FY 2022. See "Secure Design and Quantifiable Assurance Development" program below.</p> <p>FY 2023 Plans: These efforts are being merged into a combined program for both secure design and quantifiable assurance activities beginning with FY 2022. See "Secure Design and Quantifiable Assurance Development" program below.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: These efforts are being merged into a combined program for both secure design and quantifiable assurance activities beginning with FY 2022. See "Secure Design and Quantifiable Assurance Development" program below.</p>			42.800	0.000	0.000
<p>Title: Foundry</p> <p>Description: This activity will implement multiple foundries process design kit (PDK) environments ensuring the government is not dependent on one single source for critical components and enable regular dedicated and multi-project wafer runs with fabrication data products.</p>			44.338	45.000	20.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 907 / <i>Access to State-of-the-Art (SOTA) Microelectronics - Development</i>		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Commercial foundries generate enormous amounts of data on their processes as a best practice for quality assurance to improve reliability and increase yield. It will collect and utilize this data to generate and allow quantitative comparison of performance and security metrics in the design and test stage of the microelectronics life cycle, thereby mitigating risk.					
FY 2022 Plans: Planned activities are as follows: <ul style="list-style-type: none"> • Enhance access to SOTA fabrication ecosystem. • Develop program of record access to assured fabrication flow and fund multi-project wafer production runs at multiple SOTA domestic sources. 					
FY 2023 Plans: Planned activities are as follows: <ul style="list-style-type: none"> • Continue to enhance access to SOTA fabrication ecosystem. • Maintain program of record access to assured fabrication flow and fund multi-project wafer production runs at multiple SOTA domestic sources. 					
FY 2022 to FY 2023 Increase/Decrease Statement: Changes reflect a realignment of a portion of this foundry program to the “Secure Design and Quantifiable Assurance Development” program below and a re-balancing of funding between this project and PE 0605294D8Z, Trusted and Assured Microelectronics (Budget Activity 5), Project 902: “Access to State-of-the-Art (SOTA) Microelectronics – Demonstration.”					
Title: Secure Design and Quantifiable Assurance Development Description: This activity includes verifying the ability to fabricate classified and/or export-controlled designs in on-shore commercial foundries and quantify integrity of designs and end products to include authentication and identification. Funding will establish multiple strategic partnerships with existing commercial domestic microelectronics design vendors and foundries to develop a data-driven, risk-based approach to supply chain protection and demonstrate the assured manufacture of advanced electronic components. The project will continue to develop the technical means for protecting intellectual property (IP) and obfuscating the final user function from the supply chain. This result will be realized using personalization, programmability and software, following application specific integrated circuit (ASIC) manufacturing. Efforts are on-going to update International Traffic in Arms			185.821	241.976	143.738

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>		Project (Number/Name) 907 / <i>Access to State-of-the-Art (SOTA) Microelectronics - Development</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Regulations and Export Administration Regulations policy in this area. Funding will support activities to enhance the export control regime so that it maintains or strengthens current protections while enabling access to commercial capabilities, products, and IP.					
FY 2022 Plans: Planned activities are as follows: <ul style="list-style-type: none"> • Continue to enhance secure design and cloud capability with new tools/techniques. • Utilize traceability and provenance mechanisms to verify and vet data sources in a zero-trust architecture and enhance ability of DoD/Defense Industrial Base to design SOTA microelectronics. • Quantify transition of designs to prototypes and programs of record and maintain persistence in lifecycle assurance data and intellectual property. • Instantiate authentication and protection workflows for design assurance. • Demonstrate rapid transition of DoD-relevant field programmable gate array-based capabilities to structured ASICs, with security capabilities to protect DoD intellectual property (IP) during manufacture. • Conduct enhanced IP analysis; data driven risk assessments utilizing independent verification and validation, data captures, intelligence reports, probability of detection and false alarm rates, and game theoretic; and authentication and protection workflows. • Align program to provide persistent expertise delivery for application specific risk; compare design features to enhance verification and validation. • Develop a scalable classification system for design and verification ecosystem. • Analyze quantitative assurance data from pilot risk assessment demonstration. • In collaboration with industry standard bodies (Society of Automotive Engineers 32), promulgate new hardware assurance policy, best practices, and guidance via a navigable public library portal. 					
FY 2023 Plans: Planned activities are as follows: <ul style="list-style-type: none"> • Continue to enhance secure design and cloud capability with new tools/techniques. • Continue to utilize traceability and provenance mechanisms to verify and vet data sources in a zero-trust architecture and enhance ability of DoD/Defense Industrial Base to design SOTA microelectronics. • Continue to quantify transition of designs to prototypes and programs of record and maintain persistence in lifecycle assurance data and intellectual property. • Continue to demonstrate rapid transition of DoD-relevant field programmable gate array-based capabilities to structured ASICs, with security capabilities to protect DoD intellectual property (IP) during manufacture. 					
FY 2022 to FY 2023 Increase/Decrease Statement:					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0604294D8Z / Trusted and Assured Microelectronics	Project (Number/Name) 907 / Access to State-of-the-Art (SOTA) Microelectronics - Development		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Changes reflect a realignment of a portion of this foundry program to the “Secure Design and Quantifiable Assurance Development” program below and a re-balancing of funding between this project and PE 0605294D8Z, Trusted and Assured Microelectronics (Budget Activity 5), Project 902: “Access to State-of-the-Art (SOTA) Microelectronics – Demonstration.”					
<p>Title: Microelectronics Ecosystem</p> <p>Description: This enhancement enables DoD and the defense industrial base to collaborate with the commercial microelectronics industry to increase proto-type development and address the war fighter’s need to maintain and modernize weapon systems as the threat landscape shifts. It enables the use of combined cyber-security methods/cryptography in DoD hardware and utilization of complex computational capabilities in active electronically scanned array (AESA) phase array radar, electronic warfare (EW), and in secure communications, including 5G radio access network (RAN) systems. The department’s future deployment of large constellations of networked satellites requires the use of leading-edge semiconductor components to enable real time communication and computation as well as for other advanced DoD system microelectronics applications. In addition, space based and strategic weapon systems require more advanced radiation hardened microelectronics. Virtually all DoD next-generation technology transition programs demand assured access to advanced microelectronics technology and components. This modernization enhancement ensures the full realization of the T&AM program investments already made.</p> <p>FY 2023 Plans: Develop a leading edge (<7nm), commercially-viable, U.S.-located domestic wafer foundry ecosystem access capability on the order of of > 26,000 wafer starts per month for design and manufacturing of quantifiably assured, dual-use commercial and DoD custom integrated circuits. A successful WILL enable the following:</p> <ul style="list-style-type: none">• Access to a SOTA U.S. wafer foundry.• Access to commercial and critical quantifiably assured dual-use COTS integrated circuits.• Access to capabilities necessary to develop quantifiably assured custom DoD integrated circuits.• The jump-start in commercial use of the domestic foundry by key U.S. fabless companies.• Establishment of a viable design ecosystem including access to 3rd party design modules.• The reduction in the cost differential of building a U.S.-located wafer foundry verses off-shore.• The enablement of commercially-supported and enduring U.S. logic foundry capability. <p>FY 2022 to FY 2023 Increase/Decrease Statement: This enhancement enables T&AM program to demonstrate, by FY 2023-2025, full access to U.S. commercial SOTA design, foundry, and advanced packaging capability and meet DoD’s unique needs within two to three years for modernization, including for RH and photonics applications. The capability will reduce the time needed to replace microelectronics components that are generations behind the commercial sector, move away from off-shore sources for SOTA commercial integrated circuits, and accelerate the demonstration and adoption of quantifiable assurance methods throughout the microelectronics lifecycle and supply chain. Reducing the timeline by up to two years not only benefits export control and classified system protection, but also</p>			-	-	188.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 907 / <i>Access to State-of-the-Art (SOTA) Microelectronics - Development</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
the requirements of the FY 2020 National Defense Autorotation Act Section 224 for the DoD to implement commercial standards for the acquisition of assured microelectronics products by 2023.			
Accomplishments/Planned Programs Subtotals		281.769	362.558
	FY 2021	FY 2022	
Congressional Add: Design Acceleration	-	100.000	
FY 2022 Plans: Accelerate DoD access to a microelectronics quantifiable assured (MQA) design and manufacturing ecosystem leveraging commercial capabilities for long-term sustainability. The following activities could be included: <ul style="list-style-type: none"> • Development and insertion of IP for ASIC and Chiplet security including authentication, Firmware Attestation and Decryption and SOC Interface encryption. • Development and insertion of tools and techniques for Protect of silicon IP during manufacturing and test phase, including multi-chip package (MCP) with full lifecycle MQA demonstration and maturation. • Demonstration of using COTS parts in more critical DoD applications utilizing MQA ant the inherent personalization features of the COTS device. • Accelerate MQA for DoD utilizing pilot programs for maturation of process, procedures and required technical capabilities for threat mitigation. This includes development of next generation ideas to increase the effectiveness of mitigations implemented in future updates to the LoA-1, LoA-2, or LoA-3 MQA standards. • Optical Tile prototype development and demonstration for addressing very high data rate using optical transmission. 			
Congressional Adds Subtotals	-	100.000	
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604294D8Z / Trusted and Assured Microelectronics				Project (Number/Name) 907 / Access to State-of-the-Art (SOTA) Microelectronics - Development					
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Access to SOTA Microelectronics - Development	MIPR	Defense Advanced Research Projects Agency, Air Force, Army, Navy, National Security Agency : Various	1,199.177	281.769	Mar 2021	395.976	Mar 2022	362.558	Mar 2023	-		362.558	Continuing	Continuing	-
Subtotal			1,199.177	281.769		395.976		362.558		-		362.558	Continuing	Continuing	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			1,199.177	281.769		395.976		362.558		-		362.558	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 907 / <i>Access to State-of-the-Art (SOTA) Microelectronics - Development</i>	

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<i>Access to State-of-the-Art (SOTA) Microelectronics – Development</i>																												
Third Party Intellectual Property (IP) and electronic data automation (EDA) tool repository development																												
Access to SOTA commercial microelectronics technology through design and integration																												
New microelectronics capability development																												
Pilot assured access to multiple SOTA domestic fabrication sources																												
Build-out of secured design environments and persistent expertise																												
Gain access to multiple SOTA commercial foundry process design kit's (PDK's)																												
Compare SOTA performance and security metrics in design and test																												
Microelectronics Assurance and Supply Chain Standards and Best Practices Development																												
U.S. Government and Industry Engagement for demonstration of data driven quantifiable assurance tools, techniques, and risk based metrics																												
Microelectronics Assurance and Supply Chain Training for U.S. Government and Industry																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense																Date: April 2022																					
Appropriation/Budget Activity 0400 / 4										R-1 Program Element (Number/Name) PE 0604294D8Z / Trusted and Assured Microelectronics								Project (Number/Name) 907 / Access to State-of-the-Art (SOTA) Microelectronics - Development																			
										FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
										1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
DoD Microelectronics Assurance and Supply Chain Policy and Guidance Development/ Update																																					
Application Specific Integrated Circuit (ASIC) netlist analysis capability development																																					
Field programmable gate array (FPGA) analyses tool development																																					
Microelectronics assurance and supply chain technology maturation																																					
Assured design development																																					
Capture and secure microelectronics lifecycle data and new R&D																																					
Government and industry engagement to develop data driven quantifiable assurance																																					
Management/Technical Support																																					
Transition DoD-relevant FPGA-based capabilities to structured ASICs, with security capabilities to protect DoD intellectual property (IP) during manufacture																																					

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 907 / <i>Access to State-of-the-Art (SOTA) Microelectronics - Development</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Access to State-of-the-Art (SOTA) Microelectronics – Development				
Third Party Intellectual Property (IP) and electronic data automation (EDA) tool repository development	2	2021	4	2027
Access to SOTA commercial microelectronics technology through design and integration	2	2021	4	2027
New microelectronics capability development	2	2021	4	2027
Pilot assured access to multiple SOTA domestic fabrication sources	2	2021	4	2027
Build-out of secured design environments and persistent expertise	2	2021	4	2027
Gain access to multiple SOTA commercial foundry process design kit's (PDK's)	2	2021	4	2027
Compare SOTA performance and security metrics in design and test	2	2021	4	2027
Microelectronics Assurance and Supply Chain Standards and Best Practices Development	2	2021	4	2022
U.S. Government and Industry Engagement for demonstration of data driven quantifiable assurance tools, techniques, and risk based metrics	2	2021	4	2022
Microelectronics Assurance and Supply Chain Training for U.S. Government and Industry	2	2021	4	2022
DoD Microelectronics Assurance and Supply Chain Policy and Guidance Development/Update	2	2021	4	2022
Application Specific Integrated Circuit (ASIC) netlist analysis capability development	2	2021	4	2022
Field programmable gate array (FPGA) analyses tool development	2	2021	4	2022
Microelectronics assurance and supply chain technology maturation	2	2021	4	2022
Assured design development	2	2021	4	2027
Capture and secure microelectronics lifecycle data and new R&D	2	2021	4	2027
Government and industry engagement to develop data driven quantifiable assurance	2	2021	4	2022

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense				Date: April 2022	
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>		Project (Number/Name) 907 / <i>Access to State-of-the-Art (SOTA) Microelectronics - Development</i>	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
Management/Technical Support		2	2021	4	2027
Transition DoD-relevant FPGA-based capabilities to structured ASICs, with security capabilities to protect DoD intellectual property (IP) during manufacture		2	2021	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>				Project (Number/Name) 908 / <i>Access to Advanced Packaging and Testing - Development</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
908: <i>Access to Advanced Packaging and Testing - Development</i>	0.000	81.438	112.343	56.118	0.000	56.118	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project will leverage existing commercially available expertise and capability to deliver self-sustaining digital and Radio Frequency (RF) state-of-the-art (SOTA) heterogeneous integrated packaging (SHIP), assembly, and test capability.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Access to Advanced Packaging and Testing - Development	81.438	112.343	27.118
<p>Description: This project will utilize specialized DoD chiplets (small specialized die) in a heterogeneous integrated (HI) assembly, allowing the DoD to accelerate adoption of the most advanced microelectronics available. Working with world-class industrial partners will provide early access to proprietary information related to these technologies, giving DoD an asymmetrical advantage.</p> <p>This project will deliver an on-shore SHIP, assembly, and test capability. It will provide access to, personalization of, and customization for supporting DoD programs. It will enable a revolutionary leap in system performance that will greatly reduce size, weight and power (SWaP) by incorporating the immense advances in SOTA commercial off the shelf (COTS) processing technologies, such as field programmable gate arrays (FPGAs), microprocessors, and Graphic Processing Units (GPUs).</p> <p>FY 2022 Plans: Planned activities are as follows:</p> <ul style="list-style-type: none"> • Enhance secure design and packaging capability with new tools/techniques. • Continued development of secure, accessible, and cost effective SOTA heterogeneous integration design, assembly and test capability. • Establish a SOTA prototype packaging secure assembly and test source for SOTA digital and RF applications. <p>FY 2023 Plans: Planned activities are as follows:</p> <ul style="list-style-type: none"> • Enhance secure design and packaging capability with new tools/techniques. • Continued development of secure, accessible, and cost effective SOTA heterogeneous integration design, assembly and test capability. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0604294D8Z / Trusted and Assured Microelectronics	Project (Number/Name) 908 / Access to Advanced Packaging and Testing - Development		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
• Maintain and continue to develop the SOTA prototype packaging secure assembly and test source for SOTA digital and RF applications. FY 2022 to FY 2023 Increase/Decrease Statement: Funding is decreased in order to begin following the establishment of the initial advanced packaging and testing capability, which will continue to deliver proto-type designs and hardware for accelerating program adoption and for qualification, and establish further develop the infrastructure and process that supports ITAR/EAR, proprietary and security requirements.					
Title: Microelectronics Ecosystem Description: Leading-edge semiconductor design and manufacturing technology forms the basis for many of the DoD modernization priorities. This program enhancement enables secure DoD access to leading-edge semiconductor technology through domestic U.S.-located sources of custom and dual-use leading edge integrated circuits utilizing heterogeneous integration and advanced packaging. This will enable implementation of complex, computation intensive AI algorithms for DoD AI and Autonomy applications. It will also facilitate use of integrated cyber-security methods/cryptography in DoD hardware and utilization of the complex computational capability required for Active Electronically Scanned Array (AESA) Phase Array Radar System and Electronic Warfare (EW) and communications including 5G Radio access network (RAN) systems. The proposed large constellations of networked satellites will also require leading-edge semiconductor components to enable real time communication and on-satellite computation. FY 2023 Plans: Establishment of a SOTA packaging and test facility capable of packaging, testing and personalization of integrated circuits in which the fully assembled and operationally functional MCP can contain ITAR regulated and/or classified information. Expand and accelerate development: • Implementation of post-assembly personalization and operational test capabilities. • Implement MPC finish capability for additional security to protect DoD specific IP and CPI in the fully functional MCP. • Accelerate access. • Enable re-shoring mature manufacturing, assembly, and test from commercial product lines such as high-volume flip-chip capabilities. • Enable access to advanced RF packages by providing a full suite of design tools, advanced packaging platforms, and a wide selection of material choices. • Accelerate DIB and DoD maturation leveraging commercial design using developed PDKs and ADKs to design custom devices. • Accelerate DoD access to SOTA MCP products utilizing commercial packaging, assembly, and test. • Create a catalog of designs, die, chiplets, package types, etc. • Ensure Reuse and Standardization for sustainability and costs.			-	-	29.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 908 / <i>Access to Advanced Packaging and Testing - Development</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> Accelerate and expand adoption & Use in military systems to design, packaging, and assembly as a service. <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> Access to quantifiably assured dual-use COTS integrated circuits that are fabricated, assembled, tested and personalized in U.S.-located manufacturing facilities. Most dual-use COTS parts used for modernization priorities are currently manufactured in Asian facilities that do not provide measurable assurance. This situation is very unlikely to change without this enhancement.</p>			
Accomplishments/Planned Programs Subtotals		81.438	112.343
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>						Project (Number/Name) 908 / <i>Access to Advanced Packaging and Testing - Development</i>			
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Access to Advanced Packaging and Testing - Development	MIPR	Defense Advanced Research Projects Agency, Air Force, Army, Navy, National Security Agency : Various	-	81.438	Mar 2021	112.343	Mar 2022	56.118	Mar 2023	-		56.118	Continuing	Continuing	-
Subtotal			-	81.438		112.343		56.118		-		56.118	Continuing	Continuing	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	81.438		112.343		56.118		-		56.118	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 908 / <i>Access to Advanced Packaging and Testing - Development</i>	

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<i>Access to Advanced Packaging and Testing - Development</i>																												
Develop specialized DoD chiplets in a heterogeneous integrated (HI) assembly																												
Qualify and adopt advanced microelectronics packaging and test capabilities																												
Engage with world-class industrial partners to gain access to proprietary packaging technologies																												
Enhance secure design and packaging capability with new tools/techniques																												
Develop secure, accessible, and cost effective SOTA heterogeneous integration design, assembly and test capability																												
Establish a SOTA prototype packaging secure assembly and test source for SOTA digital and RF applications																												
Reduce DoD program packaging size, weight, and power requirements																												
Incorporate packaging advances in SOTA commercial off the shelf (COTS) processing technologies																												
Management/Technical Support																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 908 / <i>Access to Advanced Packaging and Testing - Development</i>	

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<i>Access to Advanced Packaging and Testing - Development</i>																												
Develop specialized DoD chiplets in a heterogeneous integrated (HI) assembly																												
Qualify and adopt advanced microelectronics packaging and test capabilities																												
Engage with world-class industrial partners to gain access to proprietary packaging technologies																												
Enhance secure design and packaging capability with new tools/techniques																												
Develop secure, accessible, and cost effective SOTA heterogeneous integration design, assembly and test capability																												
Establish a SOTA prototype packaging secure assembly and test source for SOTA digital and RF applications																												
Reduce DoD program packaging size, weight, and power requirements																												
Incorporate packaging advances in SOTA commercial off the shelf (COTS) processing technologies																												
Management/Technical Support																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 908 / <i>Access to Advanced Packaging and Testing - Development</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Access to Advanced Packaging and Testing - Development</i>				
Develop specialized DoD chiplets in a heterogeneous integrated (HI) assembly	4	2020	3	2022
Qualify and adopt advanced microelectronics packaging and test capabilities	2	2021	4	2027
Engage with world-class industrial partners to gain access to proprietary packaging technologies	2	2021	4	2027
Enhance secure design and packaging capability with new tools/techniques	2	2021	4	2027
Develop secure, accessible, and cost effective SOTA heterogeneous integration design, assembly and test capability	2	2021	4	2027
Establish a SOTA prototype packaging secure assembly and test source for SOTA digital and RF applications	2	2021	4	2027
Reduce DoD program packaging size, weight, and power requirements	2	2021	4	2027
Incorporate packaging advances in SOTA commercial off the shelf (COTS) processing technologies	2	2021	4	2027
Management/Technical Support	2	2021	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604294D8Z / Trusted and Assured Microelectronics				Project (Number/Name) 911 / Address DoD Unique Needs - Radiation Hardening and non-CMOS			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
911: Address DoD Unique Needs - Radiation Hardening and non-CMOS	0.000	50.500	169.072	107.003	0.000	107.003	154.852	136.718	134.642	128.150	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project addresses the dual problems of commanding only a small market share while requiring an expansive range of unique microelectronics needs, from boutique and legacy components to state-of-the-art (SOTA) technologies. The Government must sustain specialty suppliers, given their criticality to national security. In particular, DoD needs access to a diverse microelectronics ecosystem to develop and acquire the application specific integrated circuits (ASICs) and personalized commercial off the shelf (COTS) components required for military radiation hardened and radio frequency (RF) and optoelectronic (OE) needs.

The Department frequently relies on commercial suppliers to optimize performance and reduce costs for sophisticated weapon system and secure network functionality. It is critical to have DoD reliability access to subject matter expertise, technology, and manufacturing.

In addition to Rad Hard needs, the DoD requires access to RF and opto-electronic materials, foundries, and packaging facilities, in order to enable next generation sensors and communications. The DoD must leverage state-of-the-art microelectronic technologies driven by mega-trends such as 5G wireless and datacenters in order to combat emerging threats and provide overmatch technology to the warfighter. At the same time, the DoD must fill the gaps which are left unaddressed these dual-use mega-trends to satisfy mission requirements. By partnering in the maturation of state-of-the-art material sources, foundries, and packaging facilities, the DoD is able to tailor early process development towards unique DoD interests and encourage open access design, which stimulates innovation and drives affordability. Additionally, critical investments must be made in the domestic supply chains supporting both RF Gallium Nitride (GaN) and integrated photonics in order to maintain the integrity and security of the Defense Industrial Base.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Address DoD Unique Needs Especially - Radiation Hardening and non-CMOS - Development	40.500	82.572	52.603
Description: Government-unique trusted design and manufacturing flows have been developed to enable a tier of trust for select ASIC parts; however, this approach addresses only a small subset of DoD microelectronics requirements (e.g., processors, memory, microcontrollers, field programmable gate arrays (FPGAs), and radiation-tolerant processors).			
DoD will partner with the intelligence community, the Department of Energy, and the National Aeronautics and Space Administration to develop radiation hardened components that permit systems to operate in space and other harsh environments. state-of-the-practice (SOTP) and state-of-the-art (SOTA) technologies will be characterized and developed in support of Radiation Hardened By Process (RHBP) and Radiation Hardened By Design (RHBD) activities in support DoD modernization			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 911 / <i>Address DoD Unique Needs - Radiation Hardening and non-CMOS</i>		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>programs with radiation hardened requirements. A similar situation exists for radio frequency and optical applications. These two applications reflect only a small market with unique costs and specifications, which does not inherently create incentive for industrial investment</p> <p>Within RF and opto-electronics, investments will be made in RF GaN and integrated photonic material sources, foundries, and packaging facilities in order to enable low-size, weight, and power devices which broadly access the millimeter wave spectrum, while providing high-bandwidth data transmission.</p> <p>FY 2022 Plans: Planned activities are as follows:</p> <ul style="list-style-type: none">• Continue development of RHBD techniques in SOTA technologies with validated PDKs• Transition developed RH technologies into space and strategic programs.• Qualify large-diameter Nitrogen-Polar RF GaN material source and mature off-axis Silicon Carbide substrate.• Baseline at MRL-4 and mature towards MRL-6 multiple state-of-the-art RF GaN foundries offering open access to millimeter wave device design and advanced interconnect services.• Perform an industrial base assessment of the integrated photonics foundry ecosystem and generate actionable guidance for foundry maturation by the DoD.• Demonstrate access to state-of-the-art RF GaN and integrated photonic foundries via advanced prototype demonstrators. <p>FY 2023 Plans: Planned activities are as follows:</p> <ul style="list-style-type: none">• Continue development of RHBD techniques in SOTA technologies with validated PDKs• Transition developed RH technologies into space and strategic programs.• Continue to mature large-diameter Nitrogen-Polar RF GaN material source and off-axis Silicon Carbide substrate. Foundries will assess epiwafers and provide feedback critical to baselining the N-Polar recipe.• Continue to mature towards MRL-6 multiple state-of-the-art RF GaN foundries offering open access to millimeter wave device design and advanced interconnect services.• Act upon industrial base assessment of the integrated photonics foundry ecosystem and mature strategic components of the domestic integrated photonics supply chain.• Demonstrate access to state-of-the-art RF GaN and integrated photonic foundries via advanced prototype demonstrators. <p>FY 2022 to FY 2023 Increase/Decrease Statement: Changes reflect a rebalancing of funding between this project and PE 0605294D8Z, Trusted and Assured Microelectronics (Budget Activity 5), Project 905: “Address DoD Unique Needs - Radiation Hardening and non-CMOS - Demonstration.”</p>					
Title: Microelectronics Ecosystem			-	-	54.400

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 911 / <i>Address DoD Unique Needs - Radiation Hardening and non-CMOS</i>		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>Description: DoD requires access to Radiation Hardened (Rad Hard), radio frequency (RF), and opto-electronics (OE) that requires additional investment to accelerate and expand demonstrate product design techniques and material maturation in next generation SOTA technology nodes.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none">• Establishes the first domestic production source of N-Polar GaN material, and demonstrates production of mmW devices with maximum RF power and efficiency.• Demonstrate design and process capability with radiation hard by design tested chip, TRL-6.• Two new sources of radiation hard by design enabling onboard processing capability with 100x capability improvement.• Establishes a mature portfolio of domestic RF GaN foundries, which offers open access to millimeter wave technology and product transition via the DoD Advanced Packaging ecosystem.• Demonstrate advanced integrated photonics prototypes via secure access to state-of-the-art domestic foundries. <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p> <p>Strategic and space radiation-hardened microelectronics, and are critical in support of ongoing and future nuclear modernization and sustainment programs. This funding eliminates gaps in research and development (R&D), domestic capability, memory technologies, and test and evaluation infrastructure to alleviate the significant nuclear modernization and sustainment program risks. Additionally, RF and opto-electronic investments accelerate secure access to state of the art RF GaN and silicon photonic materials, foundries, and packaging facilities, which enables next generation sensors and communications. State-of-the-art prototypes and IP demonstrate low-size, weight, and power millimeter wave access and high-bandwidth data transmission for DoD programs and the Defense Industrial Base.</p>					
Accomplishments/Planned Programs Subtotals			40.500	82.572	107.003
			FY 2021	FY 2022	
Congressional Add: GaN and GaAs RFIC technology			10.000	25.000	
FY 2021 Accomplishments: FY 2021 Accomplishments: Initiated effort to mature SOTA RF GaN nodes towards production demonstrations and mature advanced interconnect for improved integration into advanced packaging.					
FY 2022 Plans: • Demonstrate production of SOTA RF GaN devices and advanced interconnect components in a production relevant environment. • Demonstrate millimeter wave device designs/IP via open access to SOTA RF GaN nodes.					
Congressional Add: Radiation-Hardened Fully-Depleted Silicon-on-Insulator Microelectronics			-	18.000	

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 911 / <i>Address DoD Unique Needs - Radiation Hardening and non-CMOS</i>
	FY 2021	FY 2022
FY 2022 Plans: Complementary Metal Oxide Semiconductor (CMOS) Silicon On Insulator (SOI) technology maturation, demonstration, and qualification for use in Department of Defense Space and Strategic system applications to include radiation aware Process Development Kits (PDKs), radiation hardened cell libraries, device and circuit modeling and simulation, hardware demonstration and environmental test in DoD relevant radiation environments.		
Congressional Add: Advanced Node Radiation-Hardened Fully-Depleted Silicon-on-Insulator Technology FY 2022 Plans: Advanced Complementary Metal Oxide Semiconductor (CMOS) Silicon On Insulator (SOI) research and development, technology maturation, and prototype demonstration for use in Department of Defense Space and Strategic system applications to include radiation aware Process Development Kits (PDKs), radiation hardened cell libraries, device and circuit modeling and simulation, hardware demonstration and environmental test in DoD relevant environments. Demonstrations to include use of advanced commercial CMOS SOI technology for use in hardened configurable logic and system in package prototypes. Development of design intellectual property (IP) generation models for critical semiconductor industrial base sustainment and growth, IP affordability, and asymmetric advantage for the DoD.	-	43.500
Congressional Adds Subtotals	10.000	86.500
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>				Project (Number/Name) 911 / <i>Address DoD Unique Needs - Radiation Hardening and non-CMOS</i>					
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Address DoD Unique Needs - Development	MIPR	Defense Advanced Research Projects Agency, Air Force, Army, Navy, National Security Agency : Various	-	50.500	Mar 2021	169.072	Mar 2022	107.003	Mar 2023	-		107.003	Continuing	Continuing	-
Subtotal			-	50.500		169.072		107.003		-		107.003	Continuing	Continuing	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	50.500		169.072		107.003		-		107.003	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense																				Date: April 2022																	
Appropriation/Budget Activity 0400 / 4										R-1 Program Element (Number/Name) PE 0604294D8Z / Trusted and Assured Microelectronics										Project (Number/Name) 911 / Address DoD Unique Needs - Radiation Hardening and non-CMOS																	
										FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
										1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
Address DoD Unique Needs - Development																																					
Radiation Training in Support of Radiation Hardened by Design (RHBD) and Radiation Hardened by Process (RHBP) Initiatives																																					
Strategic Radiation Hardened Electronics council (SRHEC) Coordination																																					
Strategic Radiation Support of Rapid Fielding Optoelectronic Devices																																					
Radiation hardening by process and radiation hardening by design development activities																																					
Qualify new state-of-the-art (SOTA) and state-of-the-practice (SOTP) sources for radiation hardened (RH) electronics to transition developed radiation hardened capabilities																																					
Establish 2nd source for strategic RHBP SOTP partially depleted silicon on insulator source																																					
Establish, qualify, and demonstrate advanced material sources and device process for RF and opto-electronics																																					
Access, mature, and assure state-of-the-art foundry and packaging processes for monolithic microwave integrated circuits (MMICs) and photonic integrated circuits (PICs)																																					
Demonstrate state-of-the-art RF and opto-electronic prototypes and IP for transition into the DoD advanced packaging ecosystem																																					

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense																							Date: April 2022																
Appropriation/Budget Activity 0400 / 4												R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>								Project (Number/Name) 911 / <i>Address DoD Unique Needs - Radiation Hardening and non-CMOS</i>																			
												FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
												1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Management/Technical Support																																							
												FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
												1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Address DoD Unique Needs - Development																																							
Radiation Training in Support of Radiation Hardened by Design (RHBD) and Radiation Hardened by Process (RHBP) Initiatives																																							
Strategic Radiation Hardened Electronics council (SRHEC) Coordination																																							
Strategic Radiation Support of Rapid Fielding Optoelectronic Devices																																							
Radiation hardening by process and radiation hardening by design development activities																																							
Qualify new state-of-the-art (SOTA) and state-of-the-practice (SOTP) sources for radiation hardened (RH) electronics to transition developed radiation hardened capabilities																																							
Establish 2nd source for strategic RHBP SOTP partially depleted silicon on insulator source																																							
Establish, qualify, and demonstrate advanced material sources and device process for RF and opto-electronics																																							
Access, mature, and assure state-of-the-art foundry and packaging processes for monolithic microwave integrated circuits																																							

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense																						Date: April 2022															
Appropriation/Budget Activity										R-1 Program Element (Number/Name)								Project (Number/Name)																			
0400 / 4										PE 0604294D8Z / Trusted and Assured Microelectronics								911 / Address DoD Unique Needs - Radiation Hardening and non-CMOS																			
										FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
										1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(MMICs) and photonic integrated circuits (PICs)																																					
Demonstrate state-of-the-art RF and opto-electronic prototypes and IP for transition into the DoD advanced packaging ecosystem																																					
Management/Technical Support																																					

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 911 / <i>Address DoD Unique Needs - Radiation Hardening and non-CMOS</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Address DoD Unique Needs - Development</i>				
Radiation Training in Support of Radiation Hardened by Design (RHBD) and Radiation Hardened by Process (RHBP) Initiatives	4	2020	3	2022
Strategic Radiation Hardened Electronics council (SRHEC) Coordination	4	2020	3	2022
Strategic Radiation Support of Rapid Fielding Optoelectronic Devices	2	2021	4	2027
Radiation hardening by process and radiation hardening by design development activities	2	2021	4	2027
Qualify new state-of-the-art (SOTA) and state-of-the-practice (SOTP) sources for radiation hardened (RH) electronics to transition developed radiation hardened capabilities	2	2021	4	2027
Establish 2nd source for strategic RHBP SOTP partially depleted silicon on insulator source	2	2021	4	2027
Establish, qualify, and demonstrate advanced material sources and device process for RF and opto-electronics	2	2021	4	2027
Access, mature, and assure state-of-the-art foundry and packaging processes for monolithic microwave integrated circuits (MMICs) and photonic integrated circuits (PICs)	2	2021	4	2027
Demonstrate state-of-the-art RF and opto-electronic prototypes and IP for transition into the DoD advanced packaging ecosystem	2	2021	4	2027
Management/Technical Support	2	2021	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604294D8Z / Trusted and Assured Microelectronics				Project (Number/Name) 912 / Create a Quantifiably Assured-Microelectronics Pipeline			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
912: Create a Quantifiably Assured-Microelectronics Pipeline	0.000	75.544	26.700	113.547	0.000	113.547	189.525	167.149	164.507	156.573	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project will promote microelectronics innovation and create a quantifiably-assured Microelectronics pipeline including continuing Joint Federated Assurance Center (JFAC) strategic partnerships, assuring field programmable gate array (FPGA) devices, supplier chain awareness and security, and workforce development. It will slow and in the long-term reverse offshoring trends by fostering commercial and Government alliances to preserve the U.S. ecosystem, lower barriers to innovation and adoption, strengthen workforce expertise, ensure DoD has access to the next generation of advanced technology with quantifiable assurance throughout the product pipeline, and maintain the United States as the global source for high- end, secure, and reliable microelectronics components.

In addition, this project will develop a new data driven quantifiable assurance paradigm for supply chain protection. It will strengthen security while improving access, exposing no sensitive intellectual property (IP) to the foundry and requiring post-manufacture validation of foundry products. The enhancement will develop quantifiably assured design concepts in manufactured systems, enabling a formal risk-based approach to protection techniques. Manufactured microelectronics will be tested to ensure that IP protections meet or exceed current National Security Agency standards for IP protection, and to develop DoD's ability to detect certain malicious supply chain attacks on DoD microelectronics.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Create a Quantifiably-Assured Microelectronics Pipeline – Development	70.544	16.700	55.797
Description: DoD is investing in next-generation disruptive technology, leveraging U.S. innovation, and transitioning materials, architectures, and designs into prototype capabilities for use by multiple industrial sectors. This and additional targeted investments in workforce will begin to address long-term talent needs. In addition, the Department will continue to enhance its partnership with industry to mitigate supply chain risks.			
Significant increases in assurance and protection of DoD technical data and components will be achieved through improvements in design practices, modern commercial security practices, and advanced packaging and chain of custody technologies.			
This activity, along with continued engagements and partnerships with industry will foster necessary security features in commercial products and infrastructure that will facilitate long-term assured access for the U.S. Government to commercial advanced SOTA technology providers.			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604294D8Z / Trusted and Assured Microelectronics	Project (Number/Name) 912 / Create a Quantifiably Assured-Microelectronics Pipeline		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>FY 2022 Plans:</p> <ul style="list-style-type: none">• Development of DoD program relevant application prototypes.• Foster education and workforce development to include Industry-University Cooperative Research Centers Program (IUCRC) models with the National Science Foundation (NSF) and other partners.• Execute radiation hardened, heterogeneous integration/advanced packaging, and System On A Chip design Public-Private-Academic Partnership (PPAP) Models. Develop Supply Chain PPAP model. Expand PPAP partners and collaborators.• Stimulate rapid maturation and transition of emerging technologies and co-development with industry for assurance and security.• Continue development of industry outreach strategy to address critical technologies identified by DoD assurance and intelligence analysis. Sharing developed technical threat information with industry partners. <p>FY 2023 Plans:</p> <ul style="list-style-type: none">• Development of DoD program relevant application prototypes.• Foster education and workforce development to include Industry-University Cooperative Research Centers Program (IUCRC) models with the National Science Foundation (NSF) and other partners.• Execute radiation hardened, heterogeneous integration/advanced packaging, and System On A Chip design Public-Private-Academic Partnership (PPAP) Models. Develop Supply Chain PPAP model. Expand PPAP partners and collaborators.• Stimulate rapid maturation and transition of emerging technologies and co-development with industry for assurance and security.• Continue development of industry outreach strategy to address critical technologies identified by DoD assurance and intelligence analysis. Sharing developed technical threat information with industry partners. <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p> <p>Changes reflect the realignment of quantifiable assurance activities to this Project code from Project code 907 beginning in FY 2023.</p>				
<p>Title: Microelectronics Ecosystem</p> <p>Description: DoD is required to establish assured supply chain and operational security standards for the purchase of all (Commercial and Custom) microelectronics and protection of Intellectual Property across the entire lifecycle. ME Assurance Framework addresses FY20 NDAA Sect 224 requirement for trusted supply chain and operational security standards.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none">• Enable and accelerate maturation and adoption of Microelectronics (ME) Assurance Framework.• Mature a regulatory and policy framework to enable long-term access to assured legacy and SOTA microelectronics.<ul style="list-style-type: none">o Extend access.o Evaluate, mature, and improve assurance practices.• Ensure approach is aligned as part of DoD’s comprehensive systems security engineering (SSE) framework.		-	-	57.750

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>		Project (Number/Name) 912 / <i>Create a Quantifiably Assured-Microelectronics Pipeline</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> o Trusted Systems and Networks (TSN) Analysis. o Component level – FY20 NDAA Section 224 response for custom and commercial microelectronics. • Use pilot projects to mature threat driven risk-based decision making models. • Leverages existing efforts. o DoD policy, guidance, threat identification efforts, analysis and response, mitigations, technical efforts. o Commercial standards and best practices. o Proactive Technology Analysis. • Supports breadth of DoD microelectronics. o Custom – Custom Integrated Circuit (CIC) and Field Programmable Gate Array (FPGA). o Commercial – Commercial Off The Shelf (COTS) and modified commercial components. <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> Accelerate the adoption of ME Assurance Framework utilizing microelectronics quantifiable assurance with multiple DoD pilot programs. This includes developing program guidance on baseline threats and mitigations per required level of assurance. This requires working closely with commercial industry, the defense industrial base and government JFAC subject matter experts.</p>					
Accomplishments/Planned Programs Subtotals			70.544	16.700	113.547
			FY 2021	FY 2022	
<i>Congressional Add:</i> Trusted Artificial Intelligence			5.000	10.000	
<i>FY 2021 Accomplishments:</i> Develop the Trusted AI Consortium and Public-Private-Academic Partnership (PPAP) Model through five Graduate Research Projects across three Universities.					
<i>FY 2022 Plans:</i> The overall goal of the public-private-academic partnership (PPAP) model is to develop the workforce around Embedded Systems Security/Artificial Intelligence (ESS/AI) and its intersection with Microelectronics, Embedded Systems, and Cybersecurity by training students in the emerging area of Trusted AI. Students will be trained through research projects that will address difficult problems in AI related to trust, verifiability, risk modeling, bias, fairness, human interaction, and feedback.					
Human-machine Pairing for Trustworthy AI. Develop a framework to evaluate the feedback loops between human operators and Artificial Intelligence / Machine Learning (AI/ML) systems that affect decision-making and final behavior.					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 912 / <i>Create a Quantifiably Assured-Microelectronics Pipeline</i>
	FY 2021	FY 2022
Statistical Analysis and Measurement of Neural Networks. Facilitate the development of techniques essential to the goals of the Trusted AI project and train students in the best practices that embody these techniques, ultimately providing a knowledgeable workforce for the defense ecosystem.		
AI Career-Cyber Coaching for US Workers: (1) AI Development of career cyber coaching algorithms and job maps that enable users to explore job risks and possible career paths in alignment with self-reported interests and preferences along with auto-assessed skills, with a special focus on microelectronics and the specialty areas of SCALE (including but not limited to radiation hardened technologies, heterogeneous integration/ advanced packaging, supply chain awareness, embedded systems security / artificial intelligence, and system on chip); and (2) Scale-up of training of coaches to prepare them to use the algorithm as part of career counseling services so they can guide workers with maximum effect, even and especially in times of increased demand, whether in response to regional and national labor market trends, plant closures, or a pandemic.		
Congressional Adds Subtotals	5.000	10.000
C. Other Program Funding Summary (\$ in Millions)		
N/A		
Remarks		
D. Acquisition Strategy		
N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>				Project (Number/Name) 912 / <i>Create a Quantifiably Assured-Microelectronics Pipeline</i>					
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Create a Resilient and Robust Microelectronics Pipeline	MIPR	Defense Advanced Research Projects Agency, Air Force, Army, Navy, National Security Agency : Various	-	75.544	Mar 2021	26.700	Mar 2022	113.547	Mar 2023	-		113.547	Continuing	Continuing	-
Subtotal			-	75.544		26.700		113.547		-		113.547	Continuing	Continuing	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	75.544		26.700		113.547		-		113.547	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense										Date: April 2022	
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>					Project (Number/Name) 912 / <i>Create a Quantifiably Assured-Microelectronics Pipeline</i>	

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Create a Resilient and Robust Microelectronics Pipeline																												
Develop best practices, and relationships with industry																												
Government, industry, and academic engagement to develop and demonstrate U.S. microelectronics technology dominance																												
Establish industry partnerships and innovation accelerators for assured technology co-development and prototype development with DoD acquisition programs																												
Develop limited defensive measures for the protection of commercial wireless systems including tactical radio prototypes using commercial off the shelf (COTS)																												
Formalize a commercially acceptable manufacturing model for leading-edge DoD application specific integrated circuits (ASICs)																												
Adopt commercially-manufactured academic and DoD designs; [Domestic Foundries] for ASICs and field programmable gate arrays (FPGAs)																												
Adopt advanced negative capacitance non-volatile COTS memory devices for DoD applications																												
Build connections with the U.S. Semiconductor industry to mitigate supply chain threats																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense

Date: April 2022

Appropriation/Budget Activity

0400 / 4

R-1 Program Element (Number/Name)

PE 0604294D8Z / *Trusted and Assured Microelectronics*

Project (Number/Name)

912 / Create a Quantifiably Assured-Microelectronics Pipeline

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Develop tools to analyze the health of the supply chain and track the health of the U.S. industry																												
Management/Technical Support																												
Development of DoD program relevant application prototypes																												
Education and Workforce Development to include Industry-University Cooperative Research Centers Program (IUCRC) models with the National Science Foundation (NSF) and other partners																												
Stimulate rapid maturation and transition of emerging technologies and co-development with industry for assurance and security																												
Microelectronics Assurance and Supply Chain Standards and Best Practices Development																												
U.S. Government and Industry Engagement for demonstration of data driven quantifiable assurance tools, techniques, and risk based metrics																												
Microelectronics Assurance and Supply Chain Training for U.S. Government and Industry																												
DoD Microelectronics Assurance and Supply Chain Policy and Guidance Development/ Update																												
Application Specific Integrated Circuit (ASIC) netlist analysis capability development																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense																							Date: April 2022									
Appropriation/Budget Activity										R-1 Program Element (Number/Name)								Project (Number/Name)														
0400 / 4										PE 0604294D8Z / Trusted and Assured Microelectronics								912 / Create a Quantifiably Assured-Microelectronics Pipeline														
	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
Field programmable gate array (FPGA) analyses tool development																																
Microelectronics assurance and supply chain technology maturation																																
Government and industry engagement to develop data driven quantifiable assurance																																

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 912 / <i>Create a Quantifiably Assured-Microelectronics Pipeline</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Create a Resilient and Robust Microelectronics Pipeline</i>				
Develop best practices, and relationships with industry	2	2021	4	2027
Government, industry, and academic engagement to develop and demonstrate U.S. microelectronics technology dominance	2	2021	4	2027
Establish industry partnerships and innovation accelerators for assured technology co-development and prototype development with DoD acquisition programs	2	2021	4	2027
Develop limited defensive measures for the protection of commercial wireless systems including tactical radio prototypes using commercial off the shelf (COTS)	2	2021	4	2027
Formalize a commercially acceptable manufacturing model for leading-edge DoD application specific integrated circuits (ASICs)	2	2021	4	2027
Adopt commercially-manufactured academic and DoD designs; [Domestic Foundries] for ASICs and field programmable gate arrays (FPGAs)	2	2021	4	2027
Adopt advanced negative capacitance non-volatile COTS memory devices for DoD applications	2	2021	4	2027
Build connections with the U.S. Semiconductor industry to mitigate supply chain threats	2	2021	4	2025
Develop tools to analyze the health of the supply chain and track the health of the U.S. industry	2	2021	4	2027
Management/Technical Support	2	2021	4	2027
Development of DoD program relevant application prototypes	2	2021	3	2027
Education and Workforce Development to include Industry-University Cooperative Research Centers Program (IUCRC) models with the National Science Foundation (NSF) and other partners	2	2021	3	2027
Stimulate rapid maturation and transition of emerging technologies and co-development with industry for assurance and security	2	2021	3	2027

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense				Date: April 2022	
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0604294D8Z / Trusted and Assured Microelectronics		Project (Number/Name) 912 / Create a Quantifiably Assured-Microelectronics Pipeline	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
Microelectronics Assurance and Supply Chain Standards and Best Practices Development		2	2023	4	2027
U.S. Government and Industry Engagement for demonstration of data driven quantifiable assurance tools, techniques, and risk based metrics		2	2023	4	2027
Microelectronics Assurance and Supply Chain Training for U.S. Government and Industry		2	2023	4	2027
DoD Microelectronics Assurance and Supply Chain Policy and Guidance Development/Update		2	2023	4	2027
Application Specific Integrated Circuit (ASIC) netlist analysis capability development		2	2023	4	2027
Field programmable gate array (FPGA) analyses tool development		2	2023	4	2027
Microelectronics assurance and supply chain technology maturation		2	2023	4	2027
Government and industry engagement to develop data driven quantifiable assurance		2	2023	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>				Project (Number/Name) 913 / <i>Defense Microelectronics Cross-Functional Team Funding</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
913: <i>Defense Microelectronics Cross-Functional Team Funding</i>	-	0.000	0.000	8.000	-	8.000	4.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This is not a new start Project Code in FY 2023. Funding was transferred from Program Element 0607210D8Z Project Code 821, due to a DSD-directed realignment within DoD to support the success of the Cross-Functional Team.

A. Mission Description and Budget Item Justification

Microelectronics components are the foundation of modern military systems. The Department of Defense (DoD) is exposed to various vulnerabilities that threaten the ability to source microelectronics needed to sustain programs of record. In order to prepare the Department for Great Power Competition, the DoD must take action to ensure access to the microelectronic components needed to sustain our defense programs and systems effectively and affordably. The Department also needs a better strategy to transition leading edge technology developed by both government and industry to DoD programs of record, to ensure the Department maintains a competitive edge.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Defense Microelectronics Cross-Functional Team Funding	-	-	8.000
Description: A Cross-Functional Team (CFT) was established effective January 2021 to develop a DoD strategy and implementation and transition plan to minimize vulnerabilities within the Department's microelectronic supply chain. The transition plan will be comprehensive, and include a budget plan. The CFT will function as an advisory body to the Deputy Secretary of Defense (DSD), the Under Secretary of Defense for Research and Engineering (USD(R&E)), the Under Secretary of Defense for Acquisition and Sustainment (USD(A&S)) to strengthen the domestic microelectronics supply chain.			
FY 2023 Plans: The CFT will continue to detail subject matter experts from the Services to the CFT, and execute contracts for studies to supply the analysis necessary to inform the DoD strategy development. The CFT will complete the development of the initial DoD strategy, and develop recommendations on roadmaps to execute that include the funding, policy, and legislation to ensure the strategy can be successfully executed.			
FY 2022 to FY 2023 Increase/Decrease Statement: This is not a new start Project Code in FY 2023. Funding was transferred from Program Element 0607210D8Z Project Code 821, due to a DSD-directed realignment within DoD to support the success of the Cross-Functional Team.			
Accomplishments/Planned Programs Subtotals	-	-	8.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 913 / <i>Defense Microelectronics Cross-Functional Team Funding</i>
<u>C. Other Program Funding Summary (\$ in Millions)</u> N/A		
<u>Remarks</u>		
<u>D. Acquisition Strategy</u> N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022		
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>				Project (Number/Name) 913 / <i>Defense Microelectronics Cross-Functional Team Funding</i>				

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Defense Microelectronics Cross-Functional Team Funding	MIPR	TBD : TBD	-	-		-		8.000	Apr 2023	-		8.000	Continuing	Continuing	-
Subtotal			-	-		-		8.000		-		8.000	Continuing	Continuing	N/A

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-	-	8.000	-	8.000	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense																Date: April 2022			
Appropriation/Budget Activity 0400 / 4								R-1 Program Element (Number/Name) PE 0604294D8Z / Trusted and Assured Microelectronics								Project (Number/Name) 913 / Defense Microelectronics Cross-Functional Team Funding			
																</			

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 913 / <i>Defense Microelectronics Cross-Functional Team Funding</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Defense Microelectronics Cross-Functional Team Funding</i>				
Program Support	2	2023	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604331D8Z I <i>Rapid Prototyping Program</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	313.407	89.318	137.349	179.189	0.000	179.189	183.231	189.515	195.923	201.263	-	-
638: <i>Rapid Prototyping Program</i>	313.407	89.318	103.330	109.189	0.000	109.189	112.231	114.515	116.923	119.263	-	-
073: <i>Rapid Defense Experimentation Reserve</i>	0.000	0.000	34.019	70.000	0.000	70.000	71.000	75.000	79.000	82.000	-	-

Note

New Start (Y/N): Partial
FY 2023 Fully Networked Command, Control, and Communication Focus Areas \$16.350 million
FY 2023 Fire Control Focus Area \$16.350 million

Project 073, Rapid Defense Experimentation Reserve (RDER), was added to the Rapid Prototyping Program (RPP) Program Element starting in FY 2022. To facilitate rapid modernization of the force, the RDER initiative was established in the Defense Planning Guidance for Fiscal Year 2023-2027, to encourage multi-component experimentation through a campaign of learning. Services, Agencies, and other participating organizations are to identify “best of breed” capabilities developed among the Department of Defense (DoD) prototyping programs, and execute approved projects through large-scale experiments in order to refine and/or validate the Joint Warfighting Concept (JWC). Organizations are to nominate proposals to the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) that are multi-component – involving Joint Services, International partners and/or other government agencies. These proposals should link to one or more of the four key supporting concepts, known as functional battles, of the Joint Warfighting Concept: Joint Concept for Fires, Joint Concept for Command and Control, Joint Concept for Contested Logistics, and Joint Concept for Information Advantage.

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Defend the Homeland, Build Sustainable and Long-Term Advantage, and Build a Resilient Joint Force and Defense Ecosystem.

In partnership with the Services and Defense Agencies, the Rapid Prototyping Program (RPP) accelerates joint Service and Defense Agency capability development through prototyping efforts that help push innovative technologies across the “valley of death,” and into existing Service programs of record. RPP addresses strategic joint priorities such as the National Defense Strategy, the OUSD(R&E) critical technology areas, and the Joint Warfighting Concept (JWC) needs; as well as Service or Agency identified capability gaps. New projects are nominated by the Services and Agencies, and selected with inputs from organizations including the Joint Staff, the Combatant Commands, and others in order to minimize duplication, synchronize prototyping efforts, and target projects with the widest benefit to the joint warfighter.

Overarching program goals include modernization of cross-cutting technology areas, providing fieldable end-to-end mission capabilities for Services and joint application, informing programs of record, and delivering capabilities more quickly than traditional acquisition. RPP develops prototypes that reduce technical and integration risk and accelerate capabilities to programs of record. RPP project selection aligns to priority mission and technology areas including artificial intelligence /

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604331D8Z I <i>Rapid Prototyping Program</i>
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machine learning; autonomous systems; hypersonics; electronic warfare; sensors for intelligence, surveillance, and reconnaissance (ISR); and fire control. RPP rapidly develops and fields cross-cutting, prototype capabilities demonstrated in an operational environment to inform DoD and Service leadership.

B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	92.023	103.575	0.000	0.000	0.000
Current President's Budget	89.318	137.349	179.189	-	179.189
Total Adjustments	-2.705	33.774	179.189	-	179.189
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	34.100			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.687	-			
• Adjustments to Budget Year	-	-	175.423	-	175.423
• Other Program Adjustments	-0.018	-	3.766	-	3.766
• FFRDC Reduction	-	-0.326	-	-	-

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604331D8Z / Rapid Prototyping Program				Project (Number/Name) 638 / Rapid Prototyping Program			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
638: Rapid Prototyping Program	313.407	89.318	103.330	109.189	0.000	109.189	112.231	114.515	116.923	119.263	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The Rapid Prototyping Program (RPP) develops prototypes to deliver capabilities, inform requirements, and bridge the gap between RDT&E activities and fieldable solutions. RPP facilitates and accelerates joint, cross-cutting prototyping efforts within the Services and Defense Agencies. This program has the agility to select, fund, and implement projects in the year of execution as new opportunities or threats emerge. In consultation with the Service Science and Technology (S&T) executives, selected projects generally receive a single year of funding to accelerate capability transition to Services' and Agencies' programs of record. Projects deemed critical by the Under Secretary of Defense for Research and Engineering (USD(R&E)) receive higher amounts of funding across multiple years. Planned funding supports the National Defense Strategy, the OUSD(R&E) critical technology areas, and Service and Agency needs to enable rapid response to emergent and time-sensitive threats.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: Southern Cross Integrated Flight Research Experiment (SCIFIRE)									37.900	45.400	35.200	
Description: SCIFIRE is a joint U.S.- Australia (AUS) partnership to develop and demonstrate an air-launched air-breathing hypersonic weapon prototype leveraging previous science and technology investments in hypersonics. SCIFIRE will further mature hypersonic cruise missile technologies to engage time-critical, heavily defended, and high-value targets in a contested environment. The SCIFIRE form factor provides enhanced capability by allowing for integration on fighter aircraft.												
In FY 2021, funding supported risk reduction activities, finalized system requirements, established Weapons Open System Architecture (WOSA) evaluation criteria, and began system design efforts and digital system modeling.												
FY 2022 Plans: Continue Weapons Open System Architecture (WOSA) implementation, system design efforts for the potential open system alternatives, and digital system modeling. Complete Preliminary Design for the prototype flight system. Develop prototype flight test plans and aircraft integration design in conjunction with AUS.												
FY 2023 Plans: Perform detailed design and analysis on the prototype flight system. Develop and test wind tunnel models representing weapon outer mold lines (OML) to inform aircraft integration and operational analyses.												
FY 2022 to FY 2023 Increase/Decrease Statement:												

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604331D8Z / <i>Rapid Prototyping Program</i>	Project (Number/Name) 638 / <i>Rapid Prototyping Program</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
FY 2023 funding decreases by \$10.200 million due to an offset by Air Force Life Cycle Management Center contributions to the jointly funded project.			
Title: Joint Affordable Kill-Chain Closure (JAKCC) Description: JAKCC supports the National Defense Strategy's priorities to modernize key capabilities and evolve innovative operational concepts. This effort integrates the fully networked command, control, and communications (FNC3); autonomy; electronic warfare (EW); and intelligence, surveillance, and reconnaissance (ISR) prototypes developed on an autonomous platform. A series of incremental demonstration and experimentation activities are executed in coordination with the Services and Combatant Commands to validate the platform integrated prototype capability to accelerate development and adoption of cost effective and interoperable solutions for defense challenges. The JAKCC project leverages a government reference architecture developed in coordination with the Services and Combatant Commands to enable a Service agnostic prototype acquisition strategy. In FY 2021, the JAKCC project developed a Service agnostic prototype acquisition strategy, created a government reference architecture, and initiated system engineering and platform system design changes to enable integration of prototype payloads. FY 2022 Plans: In FY 2022, the JAKCC project will complete prototype payload development. Prototypes will undergo testing in a laboratory and an operationally relevant environment prior to integration onto prototype autonomous platforms and the execution of the initial technology demonstration in late FY 2022. The project will begin preliminary planning for a FY 2023 operational demonstration in coordination with the Services and Combatant Commands. JAKCC culminates in a FY 2023 operational demonstration prior to transitioning to multiple Service programs of record for integration. FY 2023 Plans: In FY 2023 the JAKCC project plans to conduct an additional technology demonstration in early FY 2023. The project will also be finalizing, in coordination with the Services and the Combatant Commands, the plans for the operational demonstration in the third quarter of FY 2023. Following the operational demonstration the findings will be compiled to define requirements that will inform the transition, and resulting acquisition plans, for multiple Service programs of record. FY 2022 to FY 2023 Increase/Decrease Statement: In FY 2023, funding decreases are driven by the transitions from design/procurement/fabrication activities to integration/ demonstration activities. Also given the operational demonstration will conclude in the third quarter of FY 2023, the FY 2023 fourth quarter activities will consist of results documentation and project close out activities.		30.000	50.000
Title: Tactical Edge Network Targeting in a Contested Long-range Environment (TENTaCLE)		10.000	-
			-

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604331D8Z / Rapid Prototyping Program	Project (Number/Name) 638 / Rapid Prototyping Program		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Description: TENTaCLE is a joint U.S. Navy and U.S. Air Force partnership to develop and demonstrate National-Tactical Intelligence, Surveillance, Reconnaissance, and Targeting (ISR-T), Command and Control (C2) data from the cloud to tactical platforms through agile, automated, multi-link Internet Protocol (IP), satellite communication and Tactical Data Links (TDL) networks. TENTaCLE enables joint coordinated Long-Range Fires leveraging National-Tactical advantages in denied environments using resilient links. TENTaCLE is a Rapid Prototype and Rapid Fielding Program that conforms with the acquisition adaptive framework to field pods and integrated kits, ready for the “Fight Tonight” with resilient links and onboard compute sufficient for advanced networked Battle Management Aids (BMAs). TENTaCLE transitioned to the Navy and Air Force.				
Title: Advanced Prototyping to Support OUSD(R&E) Critical Technology Areas Description: This effort prototypes cutting-edge land, sea, undersea, air, and space capabilities critical to the National Defense Strategy, critical technology areas and objectives of the Department of Defense (DoD). This effort matures and demonstrates with operationally representative prototypes of fully networked command, control, and communications; 5G; space; autonomy; hypersonics; cyber; directed energy; bio-technology, and machine learning systems to accelerate development and adoption of cost effective and interoperable solutions for defense challenges. Selected projects demonstrate and deliver mature prototypes to Service programs of record; mitigate risk in DoD programs; and help characterize potential concepts of operations. Advanced prototyping activities seek to rapidly demonstrate capabilities that can help maintain the U.S. technological edge. Demonstration of advanced prototypes will involve partnerships with the Services, industry, academia, and non-traditional DoD partners. FY 2022 Plans: Projects will be selected in the year of execution to support National Defense Strategy priorities, OUSD(R&E) critical technology areas, and gaps in the joint Services’ investments. Projects focus on cost-effective, mission-focused efforts to design, mature, and deliver new concepts and technology prototypes aimed at supporting the joint Force. One to two prototype efforts are anticipated in FY 2022, leveraging joint, Service, and interagency partnerships. FY 2023 Plans: Projects will be selected in the year of execution to support National Defense Strategy priorities, OUSD(R&E) critical technology areas, and gaps in the joint Services’ investments. Projects focus on cost-effective, mission-focused efforts to design, mature, and deliver new concepts and technology prototypes aimed at supporting the joint Force. One to two prototype efforts are anticipated in FY 2023, leveraging joint, Service, and interagency partnerships. FY 2022 to FY 2023 Increase/Decrease Statement: RPP anticipates increasing funding in this focus area to accelerate high priority USD(R&E) mission prototyping efforts.		11.418	7.930	12.889
Title: Fully Networked Command, Control, and Communications Focus Area		-	-	16.350

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0604331D8Z / Rapid Prototyping Program	Project (Number/Name) 638 / Rapid Prototyping Program		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>Description: This focus area demonstrates joint prototypes and concepts of operation for the joint concept for command and control across multi-domain operations. Prototypes will help advance the Joint Warfighting Concept (JWC) roadmaps by addressing high-performance, low power embedded processing and developing algorithms for automatic resource allocating, self-configuring, and self-healing networks. Prototype systems will be demonstrated in operationally relevant, contested environments to help the United States maintain its communication advantage in near-peer conflict.</p> <p>FY 2023 Plans: RPP anticipates supporting one to two command and control projects in FY 2023. Deliverables will include developmental and fieldable prototypes demonstrated in an operational environment with warfighter participation.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding for this focus area in FY 2023 increases to support acceleration of joint concept for command and control prototyping efforts.</p>					
<p>Title: Fire Control Focus Area</p> <p>Description: This focus area develops and advances fire control systems to bring faster, more efficient target execution capabilities across multiple domains to the Combatant Commands in support of the joint concept for fires. Through coordination with the Services, projects will advance subsystems to include target tracking, weapon guidance, command, and control with deliverables that include initial capability, concept of employment, and concept of operations. Prototypes developed through these efforts will transition to Service programs of record enabling the United States to maintain technological superiority.</p> <p>FY 2023 Plans: RPP anticipates supporting one to two Fire Control projects in FY 2023. Deliverables will include developmental and fieldable prototypes demonstrated in an operational environment with warfighter participation.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding for this focus area in FY 2023 increases to support acceleration of joint concept for fires prototyping efforts.</p>			-	-	16.350
Accomplishments/Planned Programs Subtotals			89.318	103.330	109.189
C. Other Program Funding Summary (\$ in Millions)					
N/A					
Remarks					
N/A					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604331D8Z / <i>Rapid Prototyping Program</i>	Project (Number/Name) 638 / <i>Rapid Prototyping Program</i>

D. Acquisition Strategy

RPP leverages the Services' and Defense Agencies' most efficient and effective acquisition approach for rapid prototyping. This includes using Other Transaction Authorities and new or existing contract vehicles.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604331D8Z / Rapid Prototyping Program				Project (Number/Name) 638 / Rapid Prototyping Program					
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SCIFIRE	MIPR	Air Force Life Cycle Management Center : Eglin, FL	-	29.591		27.923		-		-		-	Continuing	Continuing	-
SCIFIRE	MIPR	SAF/FMBIB : Washington, DC	-	4.200		-		-		-		-	Continuing	Continuing	-
SCIFIRE	MIPR	AFLCMC EPASS : Eglin, FL	-	1.402		-		-		-		-	Continuing	Continuing	-
SCIFIRE	MIPR	MISC : Multiple	-	1.602		-		-		-		-	Continuing	Continuing	-
SCIFIRE	Option/FP	Johns Hopkins University Applied Physics Laboratory : Laurel, MD	-	-		1.000		-		-		-	Continuing	Continuing	-
SCIFIRE	MIPR	NAWC-AD : Pauxent River, MD	-	1.104		-		-		-		-	Continuing	Continuing	-
JAKCC	MIPR	AFRL : Herndon, VA	-	7.001		-		-		-		-	Continuing	Continuing	-
JAKCC	C/FP	Lead Systems Integrator : Multiple	-	10.000		-		-		-		-	Continuing	Continuing	-
JAKCC	MIPR	Naval Information Warfare Center : Pacific : San Diego, CA	-	2.250		-		-		-		-	Continuing	Continuing	-
JAKCC	MIPR	MISC : Multiple	-	2.091		-		-		-		-	Continuing	Continuing	-
JAKCC	Option/FP	Johns Hopkins University Applied Physics Laboratory : Laurel, MD	-	1.500		-		-		-		-	Continuing	Continuing	-
TENTaCLE	MIPR	NAWC-WD : China Lake, CA	-	3.900		-		-		-		-	Continuing	Continuing	-
TENTaCLE	MIPR	NAWC-AD : Patuxent River, MD	-	5.020		-		-		-		-	Continuing	Continuing	-
TENTaCLE	MIPR	MISC : Multiple	-	1.080		-		-		-		-	Continuing	Continuing	-
VARIOUS	MIPR	MULTI : MULTI	313.407	18.577	Sep 2021	74.407	Sep 2022	109.189	Sep 2023	0.000		109.189	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022		
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604331D8Z / <i>Rapid Prototyping Program</i>				Project (Number/Name) 638 / <i>Rapid Prototyping Program</i>				

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			313.407	89.318		103.330		109.189		0.000		109.189	Continuing	Continuing	N/A

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	313.407	89.318	103.330	109.189	0.000	109.189	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense										Date: April 2022	
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604331D8Z / <i>Rapid Prototyping Program</i>					Project (Number/Name) 638 / <i>Rapid Prototyping Program</i>	

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
SCIFIRE																												
Contract Award/Project Kickoff																												
Prototype Design Development																												
Prototype Development																												
Joint Affordable Kill-Chain Closure (JAKCC)																												
Project Kickoff																												
Prototype Design Development, Integration (Hardware/Software)																												
Prototype Field Demonstration																												
TENTaCLE																												
Project Kickoff																												
Prototype Design Development, Integration (Hardware/Software)																												
Prototype Field Demonstration																												
Prototype Proposal Selection																												
Proposal Submissions																												
Proposal Evaluations																												
Project Selection																												
Project Kick-offs																												

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
SCIFIRE																												
Contract Award/Project Kickoff																												
Prototype Design Development																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604331D8Z / <i>Rapid Prototyping Program</i>	Project (Number/Name) 638 / <i>Rapid Prototyping Program</i>
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	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Prototype Development																												
Joint Affordable Kill-Chain Closure (JAKCC)																												
Project Kickoff																												
Prototype Design Development, Integration (Hardware/Software)																												
Prototype Field Demonstration																												
TENTaCLE																												
Project Kickoff																												
Prototype Design Development, Integration (Hardware/Software)																												
Prototype Field Demonstration																												
Prototype Proposal Selection																												
Proposal Submissions																												
Proposal Evaluations																												
Project Selection																												
Project Kick-offs																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604331D8Z / Rapid Prototyping Program	Project (Number/Name) 638 / Rapid Prototyping Program	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
SCIFIRE				
Contract Award/Project Kickoff	1	2021	1	2021
Prototype Design Development	2	2021	4	2023
Prototype Development	4	2023	2	2025
Joint Affordable Kill-Chain Closure (JAKCC)				
Project Kickoff	4	2020	4	2020
Prototype Design Development, Integration (Hardware/Software)	1	2021	3	2022
Prototype Field Demonstration	3	2022	4	2023
TENTaCLE				
Project Kickoff	4	2021	4	2021
Prototype Design Development, Integration (Hardware/Software)	4	2021	2	2023
Prototype Field Demonstration	3	2023	4	2023
Prototype Proposal Selection				
Proposal Submissions	4	2022	1	2023
Proposal Evaluations	1	2023	1	2023
Project Selection	1	2023	1	2023
Project Kick-offs	1	2023	2	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604331D8Z / Rapid Prototyping Program				Project (Number/Name) 073 / Rapid Defense Experimentation Reserve			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
073: Rapid Defense Experimentation Reserve	0.000	0.000	34.019	70.000	0.000	70.000	71.000	75.000	79.000	82.000	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Project Code 073, Rapid Defense Experimentation Reserve (RDER), was added to the RPP Program Element starting in FY 2022. To facilitate rapid modernization of the force, the RDER initiative was established in the Defense Planning Guidance for Fiscal Year 2023-2027, to encourage multi-component experimentation through a campaign of learning. Services, Agencies, and other participating organizations are to identify “best of breed” capabilities developed among DoD prototyping programs, and execute approved projects through large-scale experiments in order to refine and/or validate the Joint Warfighting Concept (JWC). Organizations are to nominate proposals to the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) that are multi-component – involving Joint Services, International partners and/or other government agencies. These proposals should link to one or more of the four key supporting concepts (“functional battles”) of the Joint Warfighting Concept: Joint Concept for Fires, Joint Concept for Command and Control, Joint Concept for Contested Logistics, and Joint Concept for Information Advantage.

A. Mission Description and Budget Item Justification

The Department will implement multiple RDER experimentation series through Service nominated projects with execution timelines ranging from one to two years. The USD (R&E) will review project progress, recommend new projects at least annually with the goal of quickly incorporating the most promising innovative prototypes into experiments, and promptly terminate projects that fail to achieve expectations. To incentivize a disciplined approach to rapidly identify, incorporate, and execute projects largely through the Military Services, the Department will fund approved Service projects for the upcoming fiscal year out of the Department reserves. Funding decisions on additional funds in follow-on years for new projects, and funding decrements for project terminations, will be incorporated in budgets annually based on emerging requirements and periodic assessments of project viability. Services will execute these funds under oversight of the OSD in a manner consistent with the experimentation scenario for which individual projects were selected.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Rapid Defense Experimentation Reserve (RDER) Exercise Coordination and Execution	0.000	5.000	10.000
Description: RDER will execute threat informed system-of-systems experiments to fully address joint capability gaps and serve as an integrating effort for DoD and Service prototyping capabilities. Funding will provide for planning, coordination, alignment, and execution of RDER experimentation series into Joint large-scale exercises. Activities include monitoring new technologies through the innovation stakeholder community (Service labs, industry, academia, and federally funded research and development centers) in order to identify those “best of breed” capabilities to be integrated in experiments and aligned to the Defense Planning Scenarios. The integration of multiple capabilities will assess their operational utility under the Joint Warfighting Concept (JWC). Execution will consist of a series of experimentation that is conducted with existing Service and joint exercise programs. This is an FY 2022 new start.			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0604331D8Z / <i>Rapid Prototyping Program</i>		Project (Number/Name) 073 / <i>Rapid Defense Experimentation Reserve</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<i>FY 2022 Plans:</i> Establish the RDER Exercise Coordination and Execution cell. Execute the RDER pilot experiment at Exercise VALIANT SHIELD 2022. Report on results, assessments, and lessons learned, and work with Services for transition of new capabilities to new or existing programs of record. Support refinement of the JWC.					
<i>FY 2023 Plans:</i> Fully establish the RDER Exercise Coordination and Execution cell, to include liaisons and planners at the Combatant Commands. Plan and execute the RDER FY 2023 Experimentation Campaign. Report on results, assessments, and lessons learned, and work with Services for transition of new capabilities to new or existing programs of record. Support refinement of the JWC.					
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> In FY 2022, new project code 073 was created under RPP program element for Rapid Defense Experimentation Reserve (RDER) projects and activities, with funds transferred from other program elements to begin the effort. The effort is fully funded starting in FY 2023.					
<i>Title:</i> End-to-End Mission Thread Studies and Analysis <i>Description:</i> This is an FY 2022 new start project. This funding supports hypothesis and discovery efforts to better inform the capabilities required to enable the Joint Force to execute the Joint Warfighting Concept.			0.000	3.500	6.000
<i>FY 2022 Plans:</i> Execute Mission Engineering analyses, studies, and discovery experiments that will inform the identification of required warfighting capabilities and technologies to close warfighting gaps and support implementation of the Joint Warfighting Concept.					
<i>FY 2023 Plans:</i> Execute Mission Engineering analyses, studies, and discovery experiments (for experimentation series 24-1) that will inform the identification of required warfighting capabilities and technologies to close warfighting gaps and support implementation of the Joint Warfighting Concept.					
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> In FY 2022, new project code 073 was created under RPP program element for Rapid Defense Experimentation Reserve (RDER) projects and activities, with funds transferred from other program elements to begin the effort. The effort is fully funded starting in FY 2023.					
<i>Title:</i> RDER Intelligence Analysis Support			0.000	2.000	3.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604331D8Z / Rapid Prototyping Program	Project (Number/Name) 073 / Rapid Defense Experimentation Reserve		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Description: This is an FY 2022 new start project. This will provide for intelligence analysis of near-peer threats to ensure that capabilities that are included in experimentation efforts are informed by the current threat and adaptable to future adversary capabilities.</p> <p>FY 2022 Plans: Execute and produce analyses that are relevant to and inform the RDER FY 2023 Experimentation Campaign. Look ahead and plan for relevant analysis to support and inform the RDER FY 2024 campaign.</p> <p>FY 2023 Plans: Execute and produce analyses that are relevant to and inform the RDER FY 2024 Experimentation Campaign. Look ahead and plan for relevant analysis to support and inform the RDER FY 2025 campaign.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: In FY 2022, the effort stood up to ensure experiments for 23-1 and proposals for 24-1 are threat-informed. Steady state support across the fiscal years requires less funding.</p>				
<p>Title: Joint Warfighting Concept Experiments (Supporting Concepts: Fires, Command and Control, Information Advantage, and Contested Logistics)</p> <p>Description: This is an FY 2022 new start project. This will provide funding for certain individual capability experiments and experimentation series that support capabilities to enable the JWC supporting concepts, also known as the “functional battles.” Experiment proposals will be evaluated and selected in the prior fiscal year.</p> <p>FY 2022 Plans: Accelerate selected and Deputy Secretary of Defense approved 23-1 experiments and experimentation series. Evaluate and select FY 2023 proposals.</p> <p>FY 2023 Plans: Fund selected and Deputy Secretary of Defense approved 23-1 experiments and experimentation series. Evaluate and select FY 2024 proposals. Accelerate 24-1 proposals as funding allows.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: In FY 2022, new project code 073 was created under RPP program element for Rapid Defense Experimentation Reserve (RDER) projects and activities, with funds transferred from other program elements to begin the effort. The effort is fully funded starting in FY 2023.</p>		0.000	21.319	48.500
<p>Title: Joint International Experimentation for the Indo-Pacific</p>		0.000	2.200	2.500

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604331D8Z / <i>Rapid Prototyping Program</i>	Project (Number/Name) 073 / <i>Rapid Defense Experimentation Reserve</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>Description: This is an FY 2022 new start project. This will provide for planning and coordination cells in theater that will work with services, allies, and partners to plan and execute the RDER experimentation campaign in the Indo-Pacific region.</p> <p>FY 2022 Plans: Stand up the U.S. Indo-Pacific Command RDER experimentation planning and execution team. Plan and execute the RDER experimentation efforts in the Indo-Pacific region. Work with partners, allies, services, agencies, and OUSD (R&E) to develop assessment reports, recommendations, and lessons learned following experiment completion.</p> <p>FY 2023 Plans: Plan and execute the RDER experimentation efforts in the Indo-Pacific region for RDER Experiment 23-1. Work with partners, allies, services, agencies, and OUSD (R&E) to shape proposals for RDER Experiment 24-1, and develop assessment reports, recommendations, and lessons learned following 23-1 experiment completion.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: No significant change between FY 2022 and FY 2023.</p>			
Accomplishments/Planned Programs Subtotals		0.000	34.019
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
Service experimentation outcomes will be designed to validate and accelerate required capabilities enabling the JWC by evaluating and integrating prototyped technologies in operationally relevant, multi-domain environments. Experimentation results will facilitate Joint Staff analysis in the evaluation of the Joint Warfighting Concept, assist the Joint Requirements Oversight Counsel in requirements determination, and inform the Deputy's Management Action Group to make budget decisions that effect changes throughout the Department.			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022		
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604331D8Z / <i>Rapid Prototyping Program</i>				Project (Number/Name) 073 / <i>Rapid Defense Experimentation Reserve</i>				

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
VARIOUS	MIPR	MULTI : MULTI	-	-		34.019		70.000		-		70.000	Continuing	Continuing	-
Subtotal			-	-		34.019		70.000		-		70.000	Continuing	Continuing	N/A

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		34.019		70.000	-		N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity						R-1 Program Element (Number/Name)						Project (Number/Name)			
0400 / 4						PE 0604331D8Z / Rapid Prototyping Program						073 / Rapid Defense Experimentation Reserve			

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
RDER																												
Contract Award/Project Kickoff																												
Experiment Integration and risk reduction																												
Experimentation Execution and Assessment																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604331D8Z / Rapid Prototyping Program	Project (Number/Name) 073 / Rapid Defense Experimentation Reserve	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>RDER</i>				
Contract Award/Project Kickoff	3	2022	2	2023
Experiment Integration and risk reduction	3	2023	4	2023
Experimentation Execution and Assessment	4	2023	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	PE 0604341D8Z I <i>DIU Prototyping</i>											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	22.000	30.108	16.178	24.402	-	24.402	24.414	24.435	24.768	25.008	Continuing	Continuing
843: <i>DIU Prototyping</i>	22.000	30.108	7.022	9.189	-	9.189	9.200	9.245	9.578	9.816	Continuing	Continuing
844: <i>National Security Innovation Capital</i>	0.000	0.000	9.156	15.213	-	15.213	15.214	15.190	15.190	15.192	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Build a Sustainable and Long-Term Advantage, and Build a Resilient Joint Force and Defense Ecosystem.

The Defense Innovation Unit (DIU) mission is to strengthen U.S. national security by accelerating the adoption of commercial technology throughout the military and growing the national security innovation base. DIU partners with organizations across the DoD and the interagency to rapidly prototype, field, and scale commercial solutions that can save lives, lead to new operational concepts, increase efficiencies, and save taxpayer dollars. With offices in Silicon Valley, Boston, Austin, Chicago, and in the Pentagon, DIU is able to attract the best and brightest talent and cutting-edge solutions.

The National Defense Strategy for FY 2022 asserts that we have returned to an era of inter-state strategic competition with Russia and China, heightening the sense of urgency with which the nation, and Department of Defense (DoD), must reform our acquisition policies and approach to sustaining military-technical superiority. Notably, 11 of the 14 critical technology focus areas are dual use and rapidly developed by the commercial sector. While adversaries are challenging the U.S. across several dimensions, most importantly, our near peer competitors are at par or ahead of the United States in critical technology areas. Consistent with the FY 2023 Office of Management and Budget (OMB)/Office of Science and Technology Policy (OSTP) research and development budget priorities, this new era of competition requires technological superiority to ensure the United States' ability to project power, maintain international norms and rule of law, provide credible deterrence, and prevail in conflict.

DIU increases the Department's access to commercial technologies and talent, with the ultimate goal of fielding leading-edge technology to warfighters at the speed of relevance. Working across the country, and in collaboration with our allies and partners, DIU is developing new ways of doing business, growing our national security innovation base to include more "non-traditional" companies that had previously not collaborated with the military, working with traditional vendors in novel ways to increase efficiency, and challenging innovators to share their knowledge and expertise in support of our nation's defense.

Through a competitive prototype process, DIU identifies and provides access to technology companies and products on behalf of DoD organizations. Additionally, DIU executes projects to leverage commercial sector technology analogous to military applications thereby increasing dual-use technology agility for the DoD. DIU Prototyping funds facilitate the award of projects that can augment commercial technologies, existing government-owned capabilities, or concepts for defense application.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022		
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0604341D8Z I DIU Prototyping				
DIU focuses on six technology areas where commercial industry is the lead: <ul style="list-style-type: none">• Artificial Intelligence (AI)/ Machine Learning (ML) – Applying AI/ML learning to accelerate critical decision making and operational impact.• Autonomy – Adopting and countering autonomous systems with a focus on human-machine interaction and scalable teaming.• Cyber – Making enterprise combat information open, accessible, and secure for defense personnel across the globe.• Energy - Leveraging proven advancement in energy and materials technology to enhance capabilities and strengthen resilience across installation and distributed operations.• Human Systems – Optimizing the human system and its enabling platforms through enhanced equipment, innovative training, and novel health applications.• Space – Developing on-demand access to space, persistent satellite capabilities, and broadband space data transfer.						
B. Program Change Summary (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget		30.108	11.213	0.000	-	0.000
Current President's Budget		30.108	16.178	24.402	-	24.402
Total Adjustments		0.000	4.965	24.402	-	24.402
• Congressional General Reductions		-	-			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-	-			
• Congressional Adds		-	5.000			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-	-			
• FFRDC		-	-0.035	-	-	-
• Adjustments to Budget Year		-	-	14.832	-	14.832
• Economic Assumption		-	-	0.530	-	0.530
• National Security Innovation Capital		-	-	9.040	-	9.040
Congressional Add Details (\$ in Millions, and Includes General Reductions)						
Project: 843: DIU Prototyping						
Congressional Add: Pilot Program on Talent Management: Gig Eagle						
Congressional Add: National Security Innovation Capital						
Congressional Add Subtotals for Project: 843				FY 2021	FY 2022	
				3.000	-	
				15.000	-	
				18.000	-	
Project: 844: National Security Innovation Capital						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 0604341D8Z I <i>DIU Prototyping</i>	
Congressional Add Details (\$ in Millions, and Includes General Reductions)		FY 2021	FY 2022
Congressional Add: <i>Long Duration Energy Storage, including Lithium Batteries</i>		-	5.000
Congressional Add Subtotals for Project: 844		-	5.000
Congressional Add Totals for all Projects		18.000	5.000
Change Summary Explanation In FY 2022, the program received an increase of \$5 million for long duration energy storage, including lithium batteries. FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding. The FY 2023 funding request increase is to meet the Department's expanding demand for Commercial Solutions Openings (CSO) and contract awards for prototyping through Other Transaction Authority (OTA). Throughput of the DIU CSO and OTA process is expected to double by FY 2023 while the time to award process is simultaneously expected to decrease by as much as 50% (from 120 days to 60 days).			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604341D8Z / DIU Prototyping				Project (Number/Name) 843 / DIU Prototyping			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
843: DIU Prototyping	22.000	30.108	7.022	9.189	-	9.189	9.200	9.245	9.578	9.816	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Defense Innovation Unit (DIU) mission is to strengthen U.S. national security by accelerating the adoption of commercial technology throughout the military and growing the national security innovation base. DIU partners with organizations across the DoD and the interagency to rapidly prototype, field, and scale commercial solutions that can save lives, lead to new operational concepts, increase efficiencies, and save taxpayer dollars. With offices in Silicon Valley, Boston, Austin, Chicago, and in the Pentagon, DIU is able to attract the best and brightest talent and cutting-edge solutions.

The National Defense Strategy for FY 2022 asserts that we have returned to an era of inter-state strategic competition with Russia and China, heightening the sense of urgency with which the nation, and Department of Defense (DoD), must reform our acquisition policies and approach to sustaining military-technical superiority. Notably, 11 of the 14 critical technology focus areas are dual use and rapidly developed by the commercial sector. While adversaries are challenging the U.S. across several dimensions, most importantly, our near peer competitors are at par or ahead of the United States in critical technology areas. Consistent with the FY 2023 Office of Management and Budget (OMB)/Office of Science and Technology Policy (OSTP) research and development budget priorities, this new era of competition requires technological superiority to ensure the United States' ability to project power, maintain international norms and rule of law, provide credible deterrence, and prevail in conflict.

DIU increases the Department's access to commercial technologies and talent, with the ultimate goal of fielding leading-edge technology to warfighters at the speed of relevance. Working across the country, and in collaboration with our allies and partners, DIU is developing new ways of doing business, growing our national security innovation base to include more "non-traditional" companies that had previously not collaborated with the military, working with traditional vendors in novel ways to increase efficiency, and challenging innovators to share their knowledge and expertise in support of our nation's defense.

Through a competitive prototype process, DIU identifies and provides access to technology companies and products on behalf of DoD organizations. Additionally, DIU executes projects to leverage commercial sector technology analogous to military applications thereby increasing dual-use technology agility for the DoD. DIU Prototyping funds facilitate the award of projects that can augment commercial technologies, existing government-owned capabilities, or concepts for defense application.

DIU focuses on six technology areas where commercial industry is the lead:

- Artificial Intelligence (AI)/ Machine Learning (ML) – Applying AI/ML learning to accelerate critical decision making and operational impact.
- Autonomy – Adopting and countering autonomous systems with a focus on human-machine interaction and scalable teaming.
- Cyber – Making enterprise combat information open, accessible, and secure for defense personnel across the globe.
- Energy - Leveraging proven advancement in energy and materials technology to enhance capabilities and strengthen resilience across installation and distributed operations.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0604341D8Z I DIU Prototyping	Project (Number/Name) 843 I DIU Prototyping		
<ul style="list-style-type: none">• Human Systems – Optimizing the human system and its enabling platforms through enhanced equipment, innovative training, and novel health applications.• Space – Developing on-demand access to space, persistent satellite capabilities, and broadband space data transfer.					
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Title: Defense Innovation Unit (DIU) Prototyping			12.108	7.022	9.189
Description: DIU executes its mission through partnerships with Services, combatant commands, and other DoD organizations to prototype commercial solutions and scale across the Joint Force.					
FY 2022 Plans: In FY 2022, DIU Prototyping funds will facilitate additional follow-on prototype contract awards of projects and scale proven solutions across the Joint Force.					
FY 2023 Plans: In FY 2023, DIU Prototyping funds will facilitate additional follow-on prototype contract awards of projects and scale proven solutions across the Joint Force.					
FY 2022 to FY 2023 Increase/Decrease Statement: The FY 2023 funding request increase is to meet the Department's expanding demand for Commercial Solutions Openings (CSO) and contract awards for prototyping through Other Transaction Authority (OTA). Throughput of the DIU CSO and OTA process is expected to double by FY 2023 while the award process is simultaneously expected to decrease by as much as 50% (from 120 days to 60 days).					
Accomplishments/Planned Programs Subtotals			12.108	7.022	9.189
			FY 2021	FY 2022	
Congressional Add: Pilot Program on Talent Management: Gig Eagle			3.000	-	
FY 2021 Accomplishments: The intent of the Gig Eagle program is to develop a department-wide talent optimization marketplace for military personnel in the Reserve and Guard Components. The initial customer will be the U.S. Air Force, but each of the military departments are currently implementing various talent management reforms designed to allow military units to identify and access Servicemembers with pertinent and necessary experiences that might otherwise go unnoticed using traditional military assignment processes. Talent optimization efforts like Gig Eagle, which leverage commercial tools, promise to help the Department leverage the civilian and private sector skill sets of Reservists/Service members that are difficult for military units to develop or access within the regular force.					
The first iteration will focus on unlocking talent of the Reserve Components. The second iteration will expand the Gig Eagle talent pool to select active-duty members, civilians, inactive ready reserves members and other					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604341D8Z / <i>DIU Prototyping</i>	Project (Number/Name) 843 / <i>DIU Prototyping</i>
	FY 2021	FY 2022
Department of Defense (DoD) personnel. The third iteration will further expand the talent pool beyond existing DoD employees, opening up access to the world's best non-DoD talent.		
Congressional Add: National Security Innovation Capital FY 2021 Accomplishments: In FY 2021 NSIC received an appropriation of \$15M from Congress. Launched in March 2021, NSIC received more than 100 applications and utilized that appropriation to fund contracts with nine startup companies engaged across the five different Topics of Interest described above. Those products being developed by those companies involved the following technologies, among others: hypersonic, quantum phenomena and microelectronics. Contracts ranged from \$500,000 to \$3,000,000 over periods of performance between twelve and eighteen months, for first engineering design to production process prototype. The companies are located across the country including TX, SC, MI, MA, CO and CA. NSIC funding includes vetting for adversarial capital, and in two cases, NSIC funding led to the removal of such capital. *Resources will be executed in project 844 NSIC*	15.000	-
Congressional Adds Subtotals	18.000	-
C. Other Program Funding Summary (\$ in Millions) N/A <u>Remarks</u> D. Acquisition Strategy DIU primarily utilized Title 10 U.S. Code § 2371b authority to prototype projects to enhance military effectiveness through the Commercial Solutions Opening (CSO) process.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604341D8Z / <i>DIU Prototyping</i>	Project (Number/Name) 843 / <i>DIU Prototyping</i>
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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
DIU Prototyping	MIPR	Various : Various	0.159	12.311	Jan 2021	7.022		9.189		-		9.189	Continuing	Continuing	-
Autonomy	C/FFP	Various : Various	3.328	0.322		-		-		-		-	Continuing	Continuing	-
Cyber	C/FFP	Various : Various	3.820	-		-		-		-		-	Continuing	Continuing	-
Human System	C/FFP	Various : Various	2.756	0.735		-		-		-		-	Continuing	Continuing	-
Space	C/FFP	Various : Various	6.937	1.740		-		-		-		-	Continuing	Continuing	-
COVID	C/FFP	Various : Various	5.000	-		-		-		-		-	Continuing	Continuing	-
AE&M	C/FFP	Various : Various	0.000	-		-		-		-		-	Continuing	Continuing	-
National Security Innovation Capital	MIPR	Various : Various	-	15.000	Jan 2022	-		-		-		-	Continuing	Continuing	-
Subtotal			22.000	30.108		7.022		9.189		-		9.189	Continuing	Continuing	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			22.000	30.108		7.022		9.189		-		9.189	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604341D8Z / <i>DIU Prototyping</i>	Project (Number/Name) 843 / <i>DIU Prototyping</i>
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FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>DIU Prototyping</i>	
Facilitate contract awards for prototyping through Other Transaction Authority (OTA)	<div style="background-color: black; width: 250px; height: 1.2em; margin: 5px 0;"></div>

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604341D8Z / DIU Prototyping	Project (Number/Name) 843 / DIU Prototyping	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>DIU Prototyping</i>				
Facilitate contract awards for prototyping through Other Transaction Authority (OTA)	1	2022	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604341D8Z / DIU Prototyping				Project (Number/Name) 844 / National Security Innovation Capital			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
844: National Security Innovation Capital	0.000	0.000	9.156	15.213	-	15.213	15.214	15.190	15.190	15.192	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The mission of NSIC is to accelerate the development of dual-use hardware technologies critical to our national security and economic competitiveness. It is an initiative that enables dual-use hardware startups to advance key milestones in their product development by addressing the shortfall of private investment from trusted sources. NSIC's support enables companies to develop their technologies and products more rapidly. The resulting reductions in technical risk, along with the signaling of DoD interest in such dual-use companies, attracts trusted private investment that might otherwise sit on the sidelines. The overall result is more rapid and robust development of hardware in the U.S., the expansion of the defense industrial base and reduction of technology flow to adversaries.

Initial broad areas of focus are autonomy, communications, power, sensors and space.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
<p>Title: National Security Innovation Capital (NSIC)</p> <p>Description: In FY 2021 NSIC received an appropriation of \$15M from Congress. NSIC utilized that appropriation to fund contracts with nine startup companies whose technologies covered the five different Topics of Interest described above. Those technologies involved, among others: hypersonics, quantum phenomena and microelectronics. Contracts ranged from \$500,000 to \$3,000,000 over periods of performance between twelve and eighteen months. The companies are located across the country including TX, SC, MI, MA, CO and CA. This \$15 million congressional add was executed in Project Code P843 of this Program Element.</p> <p>This \$15 million congressional add, was executed in Project Code P843 of this Program Element.</p> <p>FY 2022 Plans: In FY 2022, NSIC will continue funding dual-use hardware startups developing products in autonomy, communications, power, sensors and space. Depending on the scope of the individual projects, NSIC will support requirements for several (three or four) companies with the \$5,000,000 budgeted.</p> <p>FY 2023 Plans: As in FY 2022, NSIC will continue funding dual-use hardware startups developing products in autonomy, communications, power, sensors and space. Depending on the scope of the individual projects, NSIC will support up to ten companies with the \$15,000,000 budgeted.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>	-	4.156	15.213

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604341D8Z / DIU Prototyping	Project (Number/Name) 844 / National Security Innovation Capital	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
As noted, NSIC launched with a congressional add of \$15 million in FY 2021. The FY 2022 budget of \$4 million was a 66% reduction. Only three to four contracts can be awarded. That level of activity is not sustainable - it is not at a scale that will have meaningful impact and it would be difficult to maintain the interest of the hardware startup and venture capital communities. The increase in FY 2023 enables NSIC to award eight to ten contracts, which is critical to building on the momentum and credibility that has been established.			
Accomplishments/Planned Programs Subtotals		-	4.156
		FY 2021	FY 2022
Congressional Add: Long Duration Energy Storage, including Lithium Batteries		-	5.000
FY 2022 Plans: DIU will rapidly prototype and deploy Battery Energy Storage Systems (BESS) to increase the resiliency of DoD power systems. Current BESS (or generators) support resiliency up to 4 to 8 hours. By using various chemistries and configurations from commercial BESS solutions, DIU will prototype solutions with up to 100 hours of battery storage. This will increase the resiliency and readiness of multiple DoD installations that directly support military operations.			
Resources will be executed in project 843 DIU Prototyping			
Congressional Adds Subtotals		-	5.000
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
NSIC primarily utilizes Title 10 U.S. Code § 2371b Other Transactions Authority to prototype projects to further develop dual-use, hardware-based technologies that are critical to the military through the Commercial Acceleration Opportunity (CAO) process.			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604341D8Z / <i>DIU Prototyping</i>	Project (Number/Name) 844 / <i>National Security Innovation Capital</i>
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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
NSIC	C/TBD	Various : Various	-	0.000		9.156	Mar 2022	15.213	Mar 2023	-		15.213	Continuing	Continuing	-
Subtotal			-	0.000		9.156		15.213		-		15.213	Continuing	Continuing	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	0.000		9.156		15.213		-		15.213	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604341D8Z / <i>DIU Prototyping</i>	Project (Number/Name) 844 / <i>National Security Innovation Capital</i>
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FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>National Security Innovation Capital (NSIC)</i>	
Identify startups in the identified Topics of Interest and award prototype development contracts to a total of three to four companies	<div></div>
Identify startups in the identified Topics of Interest and award prototype development contracts to a total of eight to ten companies	<div></div>

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604341D8Z / DIU Prototyping	Project (Number/Name) 844 / National Security Innovation Capital

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
National Security Innovation Capital (NSIC)				
Identify startups in the identified Topics of Interest and award prototype development contracts to a total of three to four companies	1	2022	4	2023
Identify startups in the identified Topics of Interest and award prototype development contracts to a total of eight to ten companies	1	2023	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604400D8Z I Department of Defense (DoD) Unmanned Systems Common Development
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	87.959	6.825	7.762	2.691	-	2.691	2.694	2.718	2.709	2.687	-	-
440: UAS Airspace Integration	50.619	4.538	0.822	0.807	-	0.807	0.809	0.815	0.813	0.806	-	-
442: Interoperability	33.442	1.830	6.641	1.621	-	1.621	1.643	1.658	1.652	1.639	-	-
443: Unmanned Systems Roadmap	3.898	0.457	0.299	0.263	-	0.263	0.242	0.245	0.244	0.242	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression, and Build Sustainable and Long-Term Advantage.

The Department of Defense (DoD) Unmanned Systems (UxS) Common Development program is a joint effort to develop and demonstrate common standards, architectures, and technologies that address unmanned systems' issues across all domains and all Military Services. The intent is to increase interoperability and effectiveness by promoting cooperative development of solutions that are applicable across all unmanned systems. This effort initially focused on addressing the DoD unmanned aircraft systems (UAS), to include integration into the National Airspace System (NAS) and a common, interoperable ground station architecture and associated interface standards. While UAS initially was the primary focus, interoperability among all unmanned and manned systems is the long-term goal.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	7.085	2.778	0.000	-	0.000
Current President's Budget	6.825	7.762	2.691	-	2.691
Total Adjustments	-0.260	4.984	2.691	-	2.691
• Congressional General Reductions	-	-0.016			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	5.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.260	-			
• Adjustments to Budget Year	-	-	2.691	-	2.691

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604400D8Z / Department of Defense (DoD) Unmanned Systems Common Development				Project (Number/Name) 440 / UAS Airspace Integration			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
440: UAS Airspace Integration	50.619	4.538	0.822	0.807	-	0.807	0.809	0.815	0.813	0.806	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The focus is on safe and secure integration into the National Airspace, which includes Ground Based Sense and Avoid (GBSAA), Airborne Based Sense and Avoid (ABSAA), and Unmanned Traffic Management interoperability and standards.

A. Mission Description and Budget Item Justification

Global Hawk and Triton, as well as other Group 3-5 UAS, require a sense-and-avoid (SAA) capability as an alternate means of compliance to Title 14 Code of Federal Regulations, Part 91.111 and Part 91.113, requirement to see and avoid other aircraft. The Air Force is leading the effort to develop an ABSAA system that is suitable to support operations within U.S. and foreign airspace. The RQ-4 Global Hawk, MQ-4C Triton, MQ-1B Predator, MQ-1C Gray Eagle, and MQ-9 Reaper all have a requirement for SAA capability and will leverage the technology being developed by the Air Force. The Army is leading the development of a GBSAA system to provide a solution for improved airspace access in terminal operations as well as operations/training within the GBSAA system's coverage area (e.g., Gray Eagle at Fort Hood and RQ-21 Blackjack operations at Cherry Point). This system provides a near-term solution and is an integral part of the long-term permanent solution. Long-term GBSAA systems and UAS Traffic Management (UTM) architectures, operating concepts, standards and technology are being developed to allow DoD, commercial, and privately manned and Group 1-5 Unmanned Aircraft to operate safely and effectively in the national airspace. The change in airspace procedures, airspace de-confliction, and Traffic Management requires new processes and procedures for safe and secure national airspace access.

This joint funding also supports development of common operating concepts, policy, standards, modeling and simulation, and technology to enable DoD UAS to routinely access the national and international airspace systems.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Unmanned Aircraft System Airspace Integration Initiatives	4.538	0.822	0.807
Description: Starting in FY 2010, the Department's sense and avoid (SAA) developmental efforts are enhanced by this defense-wide program element. This program has provided joint funding to accelerate the development of SAA technology and standards to enable UAS to routinely access the national and international airspace systems. This program also supports development of UAS airspace integration policy and standards as well as the modeling, simulation, and operational analysis needed to validate the standards. In FY 2013, ABSAA and GBSAA efforts transitioned to the Services.			
FY 2022 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0604400D8Z / <i>Department of Defense (DoD) Unmanned Systems Common Development</i>		Project (Number/Name) 440 / <i>UAS Airspace Integration</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>-Develop policy and architectures that support the operation of the DoD and interagency Group 1-5 UAS systems in the National Airspace System (NAS) safely by developing a UTM system, Ground-Base Sense and Avoid, and Airbourne Sense and Avoid architectures.</p> <p>-Investigate and draft Cyber security concept of operations for Manned and Unmanned Aircraft Systems operating in the national airspace with a focus on Groups 1-2 UAS by limiting Cyber security vulnerabilities.</p> <p>- Evaluate and validate identified best-candidate solutions for low size, weight, power and cost technology supporting military UAS operations in national, international and foreign national airspace with improved cyber security controls.</p> <p>- Develop quantitative safety assessment approaches that support unmanned systems operations to support emerging the DoD needs and inform rulemaking with the interagency.</p> <p>- Provide formal recommendations for safe separation standards and techniques that enable low-altitude military UAS to remain clear of other aircraft.</p> <p>- Engage in the FAA to advance the DoD UAS and Counter UAS airspace integration. Investigate and draft Cyber security concept of operations for Manned and Unmanned Aircraft Systems operating in the national airspace.</p> <p>FY 2023 Plans:</p> <p>-Continue to develop policy and architectures that support the operation of the DoD and interagency Group 1-5 UAS systems in the National Airspace System (NAS) safely by developing a UTM system, Ground-Base Sense and Avoid, and Airbourne Sense and Avoid architectures.</p> <p>- Continue to investigate and draft Cyber security concept of operations for Manned and Unmanned Aircraft Systems operating in the national airspace with a focus on Groups 1-2 UAS by limiting Cyber security vulnerabilities.</p> <p>- Continue to evaluate and validate identified best-candidate solutions for low size, weight, power and cost technology supporting military sUAS operations in national, international and foreign national airspace with improved cyber security controls.</p> <p>- Continue to develop quantitative safety assessment approaches that support unmanned systems operations to support emerging DoD needs and inform rulemaking with the interagency.</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604400D8Z / Department of Defense (DoD) Unmanned Systems Common Development	Project (Number/Name) 440 / UAS Airspace Integration	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
-Continue to provide formal recommendations for safe separation standards and techniques that enable low-altitude military UAS to remain clear of other aircraft. - Continue to engage the FAA to advance DoD UAS and Counter UAS airspace integration. Investigate and draft Cyber security concept of operations for Manned and Unmanned Aircraft Systems operating in the national airspace. <i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> There is no significant change between FY 2022 and FY 2023.			
Accomplishments/Planned Programs Subtotals		4.538	0.822
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604400D8Z I Department of Defense (DoD) Unmanned Systems Common Development				Project (Number/Name) 440 I UAS Airspace Integration					
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
GBSAA	MIPR	USAF A3 AFLCMC/ HBAG (VOLPE/ MITRE) : AFLCMC/ HBAG	34.652	3.341		0.041		-		-		-	-	-	-
DoD UTM	MIPR	NASA : Ames Research California	4.522	0.996		0.534		0.578		-		0.578	-	-	-
National Guard GBSAA	MIPR	Army PM UAS : Army Redstone, Alabama	5.863	-		-		-		-		-	-	-	-
DoD UxS adn C-UxS Architecture and Standards	MIPR	USAF/ARMY/ NAVY/NASA : Labs - California, NY, Alabama	2.371	0.000		-		-		-		-	-	-	-
Subtotal			47.408	4.337		0.575		0.578		-		0.578	-	-	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
USAF - A3 PBFA Support	Option/ LH	USAF A3 AFLCMC/ HBAG : AFLCMC/ HBAG	3.211	0.201		0.247		0.229		-		0.229	-	-	-
Subtotal			3.211	0.201		0.247		0.229		-		0.229	-	-	N/A
Remarks NA															
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			50.619	4.538		0.822		0.807		-		0.807	-	-	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense							Date: April 2022			
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0604400D8Z / Department of Defense (DoD) Unmanned Systems Common Development			Project (Number/Name) 440 / UAS Airspace Integration			
	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract	
Remarks NA										

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604400D8Z / Department of Defense (DoD) Unmanned Systems Common Development	Project (Number/Name) 440 / UAS Airspace Integration	

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
UAS Airspace Integration																												
GBSAA Development and Integration																												
Unmanned Traffic Management																												
UAS Integration NAS support																												

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
UAS Airspace Integration																												
GBSAA Development and Integration																												
Unmanned Traffic Management																												
UAS Integration NAS support																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604400D8Z / Department of Defense (DoD) Unmanned Systems Common Development	Project (Number/Name) 440 / UAS Airspace Integration	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
UAS Airspace Integration				
GBSAA Development and Integration	1	2018	4	2022
Unmanned Traffic Management	2	2018	4	2022
UAS Integration NAS support	1	2018	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604400D8Z / Department of Defense (DoD) Unmanned Systems Common Development				Project (Number/Name) 442 / Interoperability			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
442: Interoperability	33.442	1.830	6.641	1.621	-	1.621	1.643	1.658	1.652	1.639	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The Interoperability project will develop and demonstrate an interoperable, standards-based, open architecture solution for cross-domain (air, ground, maritime) unmanned systems. The intent is to improve joint and coalition interoperability and promote competition through the implementation of open standards and open architectures.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: Interoperability									1.830	6.641	1.621	
Description: Develop and demonstrate an interoperable, standards-based, open ground station architecture for cross-domain (air, ground, maritime) unmanned systems; improve joint and coalition interoperability; and promote competition through the implementation of open standards and open architectures.												
FY 2022 Plans:												
- Develop a UAS Architecture for Small Unmanned Systems.												
- Validate Autonomous Safety Precepts for Unmanned Systems.												
- Improve cybersecurity and communication links of UxS.												
- Integrate Cyber Security Policies and Standards into UxS Architectures.												
- Develop Safety standards and policy for Unmanned and Autonomous systems that will allow for the incorporation of AI.												
- Support for Unmanned Systems Interoperability and Integration workshop/technical exchange meeting.												
- Develop and Unmanned system autonomous test and Evaluation standards and architectures using modeling and simulation.												
-Investigate a Cyber secure solution for integrating Artificial Intelligent systems into Unmanned Systems.												

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604400D8Z / Department of Defense (DoD) Unmanned Systems Common Development	Project (Number/Name) 442 / Interoperability	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>- Maintain the Joint Robotics and Autonomous Systems Enterprise by maintaining DoD directed Interoperability standards across the service for all robotic and autonomous systems.</p> <p>FY 2023 Plans:</p> <p>- Continue to develop a UAS Architecture for Small Unmanned Systems.</p> <p>- Continue to validate Autonomous Safety Precepts for Unmanned Systems.</p> <p>- Continue to improve cybersecurity and communication links of UxS.</p> <p>- Continue to integrate Cyber Security Policies and Standards into UxS Architectures.</p> <p>- Continue to develop Safety standards and policy for Unmanned and Autonomous systems that will allow for the incorporation of AI.</p> <p>- Continue support for Unmanned Systems Interoperability and Integration workshop/technical exchange meeting.</p> <p>- Continue to develop and Unmanned system autonomous test and Evaluation standards and architectures using modeling and simulation.</p> <p>-Continue to investigate a Cyber secure solution for integrating Artificial Intelligent systems into Unmanned Systems.</p> <p>- Continue to maintain the Joint Robotics and Autonomous Systems Enterprise by maintaining DoD directed Interoperability standards across the service for all robotic and autonomous systems.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The significant increase from FY22 to FY23 is the congressional add in the amount of \$4.95M.</p>			
Accomplishments/Planned Programs Subtotals		1.830	6.641
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604400D8Z / Department of Defense (DoD) Unmanned Systems Common Development	Project (Number/Name) 442 / Interoperability
D. Acquisition Strategy N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense													Date: April 2022		
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604400D8Z / Department of Defense (DoD) Unmanned Systems Common Development					Project (Number/Name) 442 / Interoperability				

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
UxS Interoperability and Architecture Development	MIPR	Labs, Warfare Centers, and DoD components and support : DoD Labs, Warfare Center, DoD and support service	33.442	1.830		6.641		1.621		-		1.621	-	-	-
Subtotal			33.442	1.830		6.641		1.621		-		1.621	-	-	N/A

Remarks
 NA

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	33.442	1.830		6.641		1.621	-	-	N/A

Remarks
 NA

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense										Date: April 2022									
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604400D8Z / Department of Defense (DoD) Unmanned Systems Common Development					Project (Number/Name) 442 / Interoperability									

FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

UxS Interoperability and Architecture Development																												
Interoperability and Open Architecture																												
UxS Safety																												
UxS Development																												

FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

UxS Interoperability and Architecture Development																												
Interoperability and Open Architecture																												
UxS Safety																												
UxS Development																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604400D8Z / Department of Defense (DoD) Unmanned Systems Common Development	Project (Number/Name) 442 / Interoperability	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>UxS Interoperability and Architecture Development</i>				
Interoperability and Open Architecture	1	2018	4	2024
UxS Safety	2	2018	4	2024
UxS Development	1	2018	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604400D8Z I Department of Defense (DoD) Unmanned Systems Common Development				Project (Number/Name) 443 I Unmanned Systems Roadmap			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
443: Unmanned Systems Roadmap	3.898	0.457	0.299	0.263	-	0.263	0.242	0.245	0.244	0.242	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
This effort supports the Department's Unmanned Systems Integrated Roadmap and updates. The roadmap provides a DoD vision for the continuing development, fielding, and employment of unmanned systems technologies; establishes the current state of unmanned systems in today's force; and outlines a strategy to address common challenges to achieve the shared vision across all unmanned domains (air, ground, and maritime).												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: Unmanned Systems Roadmap									0.457	0.299	0.263	
Description: Develops, Drafts, and Produces the Department's Unmanned Systems Integrated Roadmap. Maintains policy, standards, and interoperability of Robotic and Autonomous systems across all domains.												
FY 2020 Accomplishments:												
-Established the Joint Robotics and Autonomous Systems Enterprise to further the interoperability operations.												
-Drafted and Staffed a completed the DoD UxS Safety issuance for Robotics and Autonomous Systems.												
-Analyzed the FY 2017 UxS roadmap for improved integration across the services.												
FY 2022 Plans:												
- Update the FY 2021 Unmanned Systems Integrated Roadmap and establish the Joint Robotics and Autonomous Systems standards, policies, and interoperability requirements.												
- Update the Department's Unmanned Systems Integrated Roadmap and perform related studies supporting the Department's vision for unmanned systems.												
- Continue to integrate feedback, responses, and new technology into the FY 2021 Roadmap.												
- Investigate changes to concept of operations with guidance provided by Department's vision for unmanned systems.												
FY 2023 Plans:												

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604400D8Z / Department of Defense (DoD) Unmanned Systems Common Development	Project (Number/Name) 443 / Unmanned Systems Roadmap	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> - Update Unmanned Systems Integrated Roadmap and establish the Joint Robotics and Autonomous Systems standards, policies, and interoperability requirements. - Continue Update the Department's Unmanned Systems Integrated Roadmap and perform related studies supporting the Department's vision for unmanned systems. - Continue to integrate feedback, responses, and new technology into the Roadmap. 			
FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.			
Accomplishments/Planned Programs Subtotals		0.457	0.299
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604400D8Z / Department of Defense (DoD) Unmanned Systems Common Development						Project (Number/Name) 443 / Unmanned Systems Roadmap			
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Unmanned Systems Roadmap	C/LH	Army TARDEC Unmanned System Support services : Army TARDEC	3.898	0.457		0.299		0.263		-		0.263	-	-	-
Subtotal			3.898	0.457		0.299		0.263		-		0.263	-	-	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			3.898	0.457		0.299		0.263		-		0.263	-	-	N/A
Remarks NA															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604400D8Z / Department of Defense (DoD) Unmanned Systems Common Development	Project (Number/Name) 443 / Unmanned Systems Roadmap	

FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Unmanned Systems Roadmap Development																												
Unmanned Systems Roadmap Development																												

FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Unmanned Systems Roadmap Development																												
Unmanned Systems Roadmap Development																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604400D8Z / Department of Defense (DoD) Unmanned Systems Common Development	Project (Number/Name) 443 / Unmanned Systems Roadmap	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Unmanned Systems Roadmap Development				
Unmanned Systems Roadmap Development	2	2018	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>					R-1 Program Element (Number/Name) PE 0604555D8Z I <i>Operational Energy Prototyping (OEP)</i>							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	23.069	45.779	-	45.779	54.801	59.681	60.926	62.145	Continuing	Continuing
035: <i>Operational Energy Prototyping</i>	0.000	0.000	23.069	45.779	-	45.779	54.801	59.681	60.926	62.145	Continuing	Continuing

Note

New start (Y/N): FY 2022 - Yes. FY 2023 - No.

A. Mission Description and Budget Item Justification

This program supports the Department's initiative to Build Sustainable and Long-Term Advantage.

Operational Energy Prototyping (OEP) will identify and demonstrate the most promising, innovative, and cost-effective technologies and methods that address joint high-priority operational energy requirements. OEP funding efforts will identify and mitigate energy-related risks and increase warfighting capabilities and resilience. OEP will invest in prototype and demonstrations in three focus areas:

- **Powering the Force:** Support the deployment of mobile and distributed operations with resilient and agile energy logistics in contested environments. Reduce the risks, vulnerability, and climate impacts of the DOD's dependence on fuel.
- **Electrifying the Battlespace:** Enable the electrification of weapons, platforms, unmanned systems, and soldiers to field new weapon, sensing, active defense, and other technologies. Meet the growing demands of power across the battlespace.
- **Commanding Energy:** Capture and understand energy profiles to transform the Joint Force from reactive to predictive energy management and control. Achieve real-time energy awareness and command and control at all levels.

OEP serves as the program by which operational energy technology advances made under the Operational Energy Capability Innovation (OECI) can transition to military service acquisition programs. Transition plans for each prototype will be established to ensure that components have time to plan, program, and budget for technology transition to programs of record.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604555D8Z I <i>Operational Energy Prototyping (OEP)</i>
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B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	0.000	23.200	0.000	-	0.000
Current President's Budget	0.000	23.069	45.779	-	45.779
Total Adjustments	0.000	-0.131	45.779	-	45.779
• Congressional General Reductions	-	-0.131			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Year	-	-	45.779	-	45.779

Change Summary Explanation

OEP was a new program element in FY 2022. The Secretary of Defense, per Section 324(c)(1) of the National Defense Authorization Act for FY 2021, was required to “carry out a program for the demonstration of technologies related to operational energy prototyping, including demonstration of operational energy technology” through the Assistant Secretary of Defense for Energy, Installations, and Environment. Establishing OEP meets this Congressional requirement.

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604555D8Z / Operational Energy Proto typing (OEP)				Project (Number/Name) 035 / Operational Energy Prototyping			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
035: Operational Energy Prototyping	0.000	0.000	23.069	45.779	-	45.779	54.801	59.681	60.926	62.145	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Operational Energy Prototyping (OEP) will identify and demonstrate the most promising, innovative, and cost-effective technologies and methods that address joint high-priority operational energy requirements. OEP funding efforts will identify and mitigate energy-related risks and increase warfighting capabilities and resilience. OEP will invest in prototype and demonstrations in three focus areas:

- **Powering the Force:** Support the deployment of mobile and distributed operations with resilient and agile energy logistics in contested environments. Reduce the risks, vulnerability, and climate impacts of DOD's dependence on fuel.
- **Electrifying the Battlespace:** Enable the electrification of weapons, platforms, unmanned systems, and soldiers to field new weapon, sensing, active defense, and other technologies. Meet the growing demands of power across the battlespace.
- **Commanding Energy:** Capture and understand energy profiles to transform the Joint Force from a reactive to a predictive energy management and control. Achieve real-time energy awareness and command and control at all levels.

OEP serves as the program by which operational energy technology advances made under the Operational Energy Capability Innovation program (OECI) can transition to military service acquisition programs. Transition plans for each prototype will be established to ensure that components have time to plan, program, and budget for technology transition to programs of record. Demand for this program is greater than 4 times the funding available ensuring the most competitive programs are awarded to move forward.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Operational Energy Prototyping (OEP)	0.000	23.069	45.779
Description: Operational Energy Prototyping (OEP) will identify and demonstrate the most promising, innovative, and cost-effective technologies and methods that address joint high-priority operational energy requirements. OEP will invest in prototyping and demonstrations in four focus areas: (1) support prototype development of new operational energy technologies, (2) carry out formal demonstrations at installations or in conjunction with exercises conducted by the Joint Staff, a combatant command, or a military department, (3) collect cost and performance data to overcome barriers against employing an innovative technology because of concerns regarding technical or programmatic risk, and (4) provide the tools and analysis that quantifies the mission impact of these new technologies. Transition plans for each prototype will be established to ensure that components have time to plan, program, and budget for technology transition to programs of record.			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604555D8Z / <i>Operational Energy Prototyping (OEP)</i>	Project (Number/Name) 035 / <i>Operational Energy Prototyping</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p><i>FY 2022 Plans:</i> Focus on operational energy capability improvement outcomes ready for prototyping with clear transition pathways at completion. OEP FY 2022 funding is for surge projects that require only one-year of funding. OEP projects all have a transition partner in FY 2023 or FY 2024. OEP provides bridge funding upon successful advanced technology demonstrations, keeping momentum for projects that have warfighter transition support. Seven high impact demonstration and prototype projects will be funded in FY 2022. The opportunity to fund a significantly larger number of efforts was validated in the selection of these seven projects justifying the proposed ramp up in the program in FY 2023.</p> <p><i>FY 2023 Plans:</i> Demand for funding of Operational Energy, Advanced Technology Development, mature programs is more than four times the funding available annually. In FY 2022 OECl will complete projects in energy storage, tactical microgrids, nuclear fuel production, space solar, and power and thermal management for high-energy weapons. OEP will continue to operationalize the best of these efforts with continued prototyping ahead of transition to programs of record. Additional funding will be allocated to advancing Section 324(c4) of the NDAA for FY 2021 to ensure development of a DOD-wide operational energy tool for accountability and transition.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> This program accelerates the deployment of innovative technologies that improve operational energy efficiency and security in a contested logistics environment. The demand was validated in FY22. The programmatic increase aligns with advanced technologies maturation through OECIF (0604055D8Z) and the Services to rapidly transition capability to the warfighter. The program demonstrates and transitions technologies focused on solutions to reduce the time and cost to implement and operate tactical microgrids, optimized energy storage, and extended duration and use of autonomous systems, as examples.</p>			
Accomplishments/Planned Programs Subtotals		0.000	23.069
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks N/A			
D. Acquisition Strategy N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense													Date: April 2022		
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604555D8Z / <i>Operational Energy Prototyping (OEP)</i>						Project (Number/Name) 035 / <i>Operational Energy Prototyping</i>			
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Support Contract	C/IDDQ	TBD : TBD	0.000	0.000		1.200		2.400		-		2.400	0.000	3.600	N/A
Subtotal			0.000	0.000		1.200		2.400		-		2.400	0.000	3.600	N/A
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Energy Prototyping	TBD	Various : Various	0.000	0.000		21.869		43.379		-		43.379	0.000	65.248	N/A
Subtotal			0.000	0.000		21.869		43.379		-		43.379	0.000	65.248	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		23.069		45.779		-		45.779	0.000	68.848	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense										Date: April 2022	
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604555D8Z / Operational Energy Proto typing (OEP)					Project (Number/Name) 035 / Operational Energy Prototyping	

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<i>Develop Program</i>																												
Develop FY 2022 Program																												
<i>In Progress Reviews</i>																												
FY 2022 In Progress Reviews																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604555D8Z / Operational Energy Proto typing (OEP)	Project (Number/Name) 035 / Operational Energy Prototyping

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Develop Program</i>				
Develop FY 2022 Program	3	2021	1	2022
<i>In Progress Reviews</i>				
FY 2022 In Progress Reviews	2	2022	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0604682D8Z / Wargaming & Support for Strategic Analysis (SSA)							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	14.770	3.341	3.409	3.229	-	3.229	3.143	3.510	3.327	3.428	-	-
104: Wargaming & Support for Strategic Analysis	14.770	3.341	3.409	3.229	-	3.229	3.143	3.510	3.327	3.428	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression, Defend the Homeland, and Build Sustainable and Long-Term Advantage.

This program supports the Office of the Director, Cost Assessment & Program Evaluation (CAPE) by funding activities that help CAPE to implement warfighting analysis in support of the National Defense Strategy. The CAPE accomplishes this by leading studies to support campaign analysis and analytical research across a spectrum of national security issues and concerns.

These RDT&E resources support critical studies and analyses to assist senior DoD leaders in optimally balancing the lethality, partnership, and reform levels of effort to carry out the National Defense Strategy. The research agenda focuses on near to long-term problems identified by the Deputy Secretary of Defense, and addresses difficult and complex questions linked to program alternatives for current and future capabilities and forces in order to enhance the senior leadership's deliberations and decision-making.

This program provides the scientific and technical engineering services needed for research studies in the development of models and simulations and the evaluation of current analytical tools and scientific methods used to evaluate and assess scenarios and concepts of operations (CONOPS) for a wide range of warfighting environments and scenarios. Deliverables from this program will include reports, briefings, and analyses designed to illuminate findings and assessments to inform Operation Plan development and DoD's approach to concept development, joint campaign analysis, evaluation, and force development.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604682D8Z I <i>Wargaming & Support for Strategic Analysis (SSA)</i>
---	---

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	3.469	3.519	0.000	-	0.000
Current President's Budget	3.341	3.409	3.229	-	3.229
Total Adjustments	-0.128	-0.110	3.229	-	3.229
• Congressional General Reductions	-	-0.110			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.128	-			
• Adjustments to budget year	-	-	3.229	-	3.229

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604682D8Z / Wargaming & Support for Strategic Analysis (SSA)				Project (Number/Name) 104 / Wargaming & Support for Strategic Analysis			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
104: Wargaming & Support for Strategic Analysis	14.770	3.341	3.409	3.229	-	3.229	3.143	3.510	3.327	3.428	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program supports the Office of the Director, Cost Assessment & Program Evaluation (CAPE). It funds activities that help CAPE to implement the vision of the Deputy Secretary of Defense to support new approaches to campaign analysis. CAPE will accomplish this by leading studies and developing analytic tools to think about future capabilities and posture.

This program provides for analytical research across a spectrum of issues and concerns. The research agenda is focused on near to long-term problems identified by the Deputy Secretary of Defense, and addresses difficult and complex questions linked to program alternatives for current and future capabilities and forces in order to enhance the senior leadership's deliberations and decision-making.

This program provides the scientific and technical engineering services needed for research studies in the development of models and simulations and the evaluation of current analytical tools and scientific methods used to evaluate and assess future scenarios and concepts of operations (CONOPS) for a wide range of warfighting environments and scenarios. Deliverables from this program will include reports, briefings, and analyses designed to illuminate findings and assessments. Outcomes include the compilation and campaign analyses data to support the DoD capabilities to the challenges of a near-peer warfight and strategic and programmatic options for post INF treaty weapons options.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2021	FY 2022	FY 2023
Title: Wargaming & Support for Strategic Analysis	3.341	3.409	3.229
Articles:	1	-	-
Description: This program provides for analytical research across a spectrum of issues and concerns. The research agenda is focused on near to long-term problems identified by the Deputy Secretary of Defense, and addresses difficult and complex questions linked to program alternatives for current and future capabilities and forces in order to enhance the senior leadership's deliberations and decision-making.			
FY 2022 Plans: Studies, analyses, and assessments will be focused on: - Developing and refining warfighting objectives from senior leader priorities and Strategic Support Analysis activities - Overseeing concept, analysis, and force design work			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604682D8Z / <i>Wargaming & Support for Strategic Analysis (SSA)</i>	Project (Number/Name) 104 / <i>Wargaming & Support for Strategic Analysis</i>	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2021	FY 2022
- Providing guidance to DoD on best practices for Service Concepts and long range fires decision <i>FY 2023 Plans:</i> Studies, analyses, and assessments will be focused on: - Developing and refining warfighting objectives from senior leader priorities and Strategic Support Analysis activities - Overseeing concept, analysis, and force design work - Providing guidance to DoD on best practices for Service Concepts and long range fires decision - Analytic Working Group initiatives to comprehensively assess, recommend, and oversee execution of enterprise reforms necessary to improve the Department's ability to analytically advance the Secretary's priorities <i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> FY 2023 decrease will result in CAPE's inability to completely fulfill the DSD's priority for DoD level analysis to perform strategic analyses that would inform joint campaign effectiveness, force structure, and the overall defense budget. Resources will fund a mix of research activities to carry out the plans stated above.			
Accomplishments/Planned Programs Subtotals		3.341	3.409
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
A mix of competitive contracts with commercial firms and research provided by university-affiliated research centers (UARCs), and Federally Funded Research and Development Centers (FFRDCs).			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604682D8Z / <i>Wargaming & Support for Strategic Analysis (SSA)</i>						Project (Number/Name) 104 / <i>Wargaming & Support for Strategic Analysis</i>			
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Wargaming & Support for Strategic Analysis	C/Various	Various : DC Metro Area	14.770	3.341	Jan 2021	3.409		3.229		-		3.229	Continuing	Continuing	N/A
Subtotal			14.770	3.341		3.409		3.229		-		3.229	Continuing	Continuing	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			14.770	3.341		3.409		3.229		-		3.229	Continuing	Continuing	N/A
Remarks The CAPE will accomplish this program by leading warfighting analysis, mission engineering threads, and analysis of concepts of operations. Funds will be awarded for high-priority projects based on competition, and the awards will include analysis of proposed costs.															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense										Date: April 2022			
Appropriation/Budget Activity					R-1 Program Element (Number/Name)					Project (Number/Name)			
0400 / 4					PE 0604682D8Z / Wargaming & Support for Strategic Analysis (SSA)					104 / Wargaming & Support for Strategic Analysis			

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Wargaming & Support for Strategic Analysis																												
Wargaming & Support for Strategic Analysis																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604682D8Z / Wargaming & Support for Strategic Analysis (SSA)	Project (Number/Name) 104 / Wargaming & Support for Strategic Analysis	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Wargaming & Support for Strategic Analysis				
Wargaming & Support for Strategic Analysis	1	2021	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0303191D8Z I Joint Electromagnetic Technology (JET) Program
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	20.271	0.997	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
192: Joint Electromagnetic Technology (JET) Program	20.271	0.997	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

New Start (Y/N): No

Starting in FY 2022, PE 0303191D8Z Joint Electromagnetic Technology (JET) Program transfers to PE 0305199D8Z Net Centricity.

A. Mission Description and Budget Item Justification

The JET program supports the Defense Community in actively pursuing technical and regulatory solutions that benefit the DoD while also understanding the ever-changing global telecommunication market and subsequent technology trends to support robust public policy deliberations and decisions. This program supports the Defense Community in general with a particular emphasis on Electromagnetic Spectrum (EMS) Operations, band assessments, and technology assessments to effectively support the Department's efforts to procure and field new capabilities. Details of the program are classified.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.997	0.000	0.000	-	0.000
Current President's Budget	0.997	0.000	0.000	-	0.000
Total Adjustments	0.000	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			

Change Summary Explanation

Starting in FY 2022, PE 0303191D8Z Joint Electromagnetic Technology (JET) Program transfers to PE 0305199D8Z Net Centricity.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Title: JET Program Initiatives	0.997	0.000	-

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0303191D8Z I Joint Electromagnetic Technology (JET) Program	

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<i>FY 2022 Plans:</i> Starting in FY 2022, PE 0303191D8Z Joint Electromagnetic Technology (JET) Program transfers to PE 0305199D8Z Net Centricity.			
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> Starting in FY 2022, PE 0303191D8Z Joint Electromagnetic Technology (JET) Program transfers to PE 0305199D8Z Net Centricity.			
Accomplishments/Planned Programs Subtotals	0.997	0.000	-

D. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

E. Acquisition Strategy
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0303191D8Z / <i>Joint Electromagnetic Technology (JET) Program</i>						Project (Number/Name) 192 / <i>Joint Electromagnetic Technology (JET) Program</i>			
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Engineering Services	Option/ FFP	Various : Various	14.289	-		-		-		-		-	-	-	-
Subtotal			14.289	-		-		-		-		-	-	-	N/A
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/Various	Various : Various	3.299	-		-		-		-		-	-	-	-
Engineering Support FFRDC	Option/ Various	Various : Various	2.683	0.997	Jul 2021	-		-		-		-	Continuing	Continuing	-
Subtotal			5.982	0.997		-		-		-		-	Continuing	Continuing	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			20.271	0.997		-		-		-		-	Continuing	Continuing	N/A
Remarks NA															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense										Date: April 2022			
Appropriation/Budget Activity					R-1 Program Element (Number/Name)					Project (Number/Name)			
0400 / 4					PE 0303191D8Z / Joint Electromagnetic Technology (JET) Program					192 / Joint Electromagnetic Technology (JET) Program			

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Joint Electromagnetic Technology Program																												
FY21 Project Execution																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0303191D8Z I Joint Electromagnetic Technology (JET) Program	Project (Number/Name) 192 I Joint Electromagnetic Technology (JET) Program

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Joint Electromagnetic Technology Program				
FY21 Project Execution	3	2021	2	2022

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: Research, Development, Test & Evaluation, Defense-Wide / BA 5: System Development & Demonstration (SDD)					PE 0604123D8Z / Chief Digital Artificial Intelligence Officer							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	273.340	-	273.340	285.229	224.135	230.675	233.388	Continuing	Continuing
067: AI/ML Demonstration & Validation	-	0.000	0.000	273.340	-	273.340	285.229	224.135	230.675	233.388	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to build enduring advantage and build a resilient Joint Force and Defense ecosystem. On December 8, 2021, the Deputy Secretary of Defense (DSD) issued a memo establishing the Chief Digital and Artificial Intelligence Officer (CDAO) as the Department's senior official responsible for strengthening and integrating data, artificial intelligence, and digital solutions in the Department. The memorandum establishes the CDAO as the "successor organization to the Joint Artificial Intelligence Center (JAIC)". The CDAO reached Initial Operational Capacity (IOC) on February 1, 2022 and will integrate the JAIC, the Defense Digital Service (DDS), the Office of the Chief Data Officer (OCDO), and the Advancing Analytics (Advana) office from OUSD (Comptroller) as it approaches Full Operational Capacity (FOC) on June 1, 2022.

The integration of the JAIC, OCDO, DDS, and Advana into the CDAO more comprehensively restructures how the Department approaches the complex and dynamic challenges of becoming a digital, data, and Artificial Intelligence (AI) enabled enterprise capable of operating at the speed and scale necessary accelerate the Department's adoption of data, analytics, and AI to preserve decision advantage.

The functions of the CDAO are as follows: lead and oversee DoD's strategy development and policy formulation for data, analytics, and AI; break down barriers to data and AI adoption within DoD institutional processes; create enabling digital infrastructure and services that support Components' development and deployment of data, analytics, AI, and digital-enabled solutions; selectively scale proven digital and AI-enabled solutions focused on enterprise and joint use cases; and surge digital services for rapid response to crises and emergent challenges. This also requires CDAO to integrate the capabilities, personnel, resources, and governance of its constituent organizations, while concurrently sustaining momentum on priority projects that align to CDAO's mission. These include expanding the enterprise data repository, establishing a responsible AI ecosystem, executing the AI and Data Accelerator (ADA) initiative, and developing a Data, Analytics, and AI Adoption Strategy. These various lines of effort will support the overarching mission of accelerating the Department's adoption of data, analytics, and AI to preserve decision advantage across the Joint Force.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
0400: Research, Development, Test & Evaluation, Defense-Wide I BA 5: System Development & Demonstration (SDD)		PE 0604123D8Z I Chief Digital Artificial Intelligence Officer			
B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	273.340	-	273.340
Total Adjustments	0.000	0.000	273.340	-	273.340
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustment to Budget Year	-	-	273.340	-	273.340
Change Summary Explanation					
On December 8, 2021, the DSD issued a memo establishing the CDAO as the Department’s senior official responsible for strengthening and integrating data, artificial intelligence, and digital solutions in the Department. The memorandum establishes the CDAO as the “successor organization to the JAIC”. The CDAO reached IOC on February 1, 2022 and will integrate the JAIC, the DDS, the OCDO, and Advana as it approaches FOC on June 1, 2022.					
The FY 2023 changes reflect the transfer in of funding to support the consolidation of the Department’s existing functional efforts in order to align manpower and funding resources under the OCDAO; increases for Advana to address the gaps for collecting, reporting, and analyzing mishap data across the military departments’ safety centers, as identified in the GAO report 18-586R on Military Aviation Mishaps; and increases to develop Adversarial AI Test & Evaluation capabilities, AI/ML model card standards, a Scalable AI Test Harness, the CDAO data repository, data service marketplace, and enterprise ontologies in support of the 26 May, 2021, DSD memo on Responsible AI, which directed “establishing a test and evaluation and verification framework that integrates real-time monitoring, algorithm confidence metrics, and user feedback to ensure trusted and trustworthy AI capabilities.”					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0604123D8Z / Chief Digital Artificial Intel ligence Officer				Project (Number/Name) 067 / AI/ML Demonstration & Validation			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
067: AI/ML Demonstration & Validation	-	0.000	0.000	273.340	-	273.340	285.229	224.135	230.675	233.388	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

On December 8, 2021, the DSD issued a memo establishing the CDAO as the Department's senior official responsible for strengthening and integrating data, artificial intelligence, and digital solutions in the Department. The memorandum establishes the CDAO as the "successor organization to the JAIC". The CDAO reached IOC on February 1, 2022 and will integrate the JAIC, the DDS, the OCDO, and Advana as it approaches FOC on June 1, 2022.

The integration of the JAIC, OCDO, DDS, and Advana into the CDAO more comprehensively restructures how the Department approaches the complex and dynamic challenges of becoming a digital, data, and Artificial Intelligence (AI) enabled enterprise capable of operating at the speed and scale necessary accelerate the Department's adoption of data, analytics, and AI to preserve decision advantage.

The functions of the CDAO are as follows: lead and oversee DoD's strategy development and policy formulation for data, analytics, and AI; break down barriers to data and AI adoption within DoD institutional processes; create enabling digital infrastructure and services that support Components' development and deployment of data, analytics, AI, and digital-enabled solutions; selectively scale proven digital and AI-enabled solutions focused on enterprise and joint use cases; and surge digital services for rapid response to crises and emergent challenges. This also requires CDAO to integrate the capabilities, personnel, resources, and governance of its constituent organizations, while concurrently sustaining momentum on priority projects that align to CDAO's mission. These include expanding the enterprise data repository; establishing a responsible AI ecosystem; executing the ADA initiative; and developing a Data, Analytics, and AI Adoption Strategy. These various lines of effort will support the overarching mission of accelerating the Department's adoption of data, analytics, and AI to preserve decision advantage across the Joint Force.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: CDAO: Building Resiliency and Readiness (USD(P&R)) ADVANA	0.000	-	1.900
Description: The GAO report 18-586R on Military Aviation Mishap findings showed that there are gaps on OUSD(P&R)'s approach for collecting, reporting, and analyzing mishap data due to lack of standardized reporting elements across the military departments' safety centers. Advana is a technology platform that not only houses a collection of enterprise data but expands the boundaries of a standard data warehouse by arming military and business decision-makers with decision support analytics, visualizations, and data tools. Advana can be an asset to the Joint Safety Council, once established, to aid in the assessment of Services' aviation mishap data supporting improvement in aviation safety.			
FY 2023 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604123D8Z / Chief Digital Artificial Intel ligence Officer	Project (Number/Name) 067 / AI/ML Demonstration & Validation		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
FY 2023 plans will allow for the enhancement of the Advanced Analytics (Advana) program to incorporate the standardized data elements for data collection from the Services to fulfill the USD(P&R) reporting requirements supporting the DoD concurred findings in the GAO report 18-586R on Military Aviation Mishap. FY 2022 to FY 2023 Increase/Decrease Statement: We anticipate an increase in infrastructure, licenses, and labor. a. Infrastructure (\$0.75M RDT&E) – Advana leverages commercial cloud across NIPR, SIPR, and JWICs networks with a robust infrastructure to support improved security and advanced data access restrictions. The costs of compute and data storage costs across the Advana infrastructure increases linearly with each additional use case. b. Licenses Costs (\$0.25M RDT&E) – Advana is comprised of best-in-class commercial products and open-source solutions. Support to new source systems and automated analytics increases requirements for the Advana Data Ingest tool suite (COTS tools StreamSets and Databricks). Users of the platform also require licenses for our Data Science Tool Suite (COTS tools Qlik and Databricks). c. Labor (\$0.9M RDT&E) – Advana contract personnel will provide direct support to the Joint Safety Council with data ingest, analytics, and visualizations to support decision making. Additional labor is required for technical support, system administration, COTS configuration, and user success.				
Title: Establishment of the Chief Digital and Artificial Intelligence Officer Description: On December 8, 2021, the DSD issued a memo establishing the CDAO as the Department’s senior official responsible for strengthening and integrating data, artificial intelligence, and digital solutions in the Department. The memorandum establishes the CDAO as the “successor organization to the JAIC”. The CDAO reached IOC on February 1, 2022 and will integrate the JAIC, the DDS, the OCDO, and Advana as it approaches FOC on June 1, 2022. The integration of the JAIC, OCDO, DDS, and Advana into the CDAO more comprehensively restructures how the Department approaches the complex and dynamic challenges of becoming a digital, data, and Artificial Intelligence (AI) enabled enterprise capable of operating at the speed and scale necessary to accelerate the Department’s adoption of data, analytics, and AI to generate decision advantage. The functions of the CDAO are as follows: lead and oversee DoD’s strategy development and policy formulation for data, analytics, and AI; break down barriers to data and AI adoption within DoD institutional processes; create enabling digital infrastructure and services that support Components’ development and deployment of data, analytics, AI, and digital-enabled solutions; selectively scale proven digital and AI-enabled solutions focused on enterprise and joint use cases; and surge digital services for rapid response to crises and emergent challenges. This also requires CDAO to integrate the capabilities, personnel, resources, and governance of its constituent organizations, while concurrently sustaining momentum on priority projects that align		0.000	-	158.832

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604123D8Z / <i>Chief Digital Artificial Intel ligence Officer</i>	Project (Number/Name) 067 / <i>AI/ML Demonstration & Validation</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>to CDAO's mission. These include expanding the enterprise data repository; establishing a responsible AI ecosystem; executing the ADA initiative; and developing a Data, Analytics, and AI Adoption Strategy. These various lines of effort will support the overarching mission of accelerating the Department's adoption of data, analytics, and AI to preserve decision advantage across the Joint Force.</p> <p>CDAO develops, tests, prototypes, and demonstrates innovative AI, Machine Learning (ML), data infrastructure, and model/algorithm test and assessment capabilities to integrate AI/ML capabilities across numerous domains and technical areas including maintenance and supply chain, personnel recovery, infrastructure assessment, geospatial monitoring during disaster, and cyber-threat situational awareness using AI anomaly detection and network exploration techniques. CDAO develops and evaluates integrated prototype technologies in realistic operating environments with DoD entities to assess the performance or cost reduction potential of applying such advanced technology to scale across multiple services. CDAO does this by aligning rapid prototype projects under Warfighter Support and leverages existing commercial technology for DoD use, built upon a common architecture that enables the DoD to rapidly scale AI Enterprise Capabilities.</p> <p>FY 2023 Plans: In FY 2023, the CDAO will continue to make progress in transforming the Department through AI, and understanding the importance of remaining agile and adapting to meet the diverse needs. The CDAO's Warfighter Support and Enterprise Capabilities will be tailored to meet these needs, and the personnel supporting these efforts are the CDAO's front-line of support to DoD components.</p> <p>The CDAO will continue to build on the Responsible AI eco-system to ensure the ethical, legal and moral foundations of our AI activities is reflected in every step of AI Development and implementation processes. CDAO will continue to work to ensure the RAI process flows through Test and Evaluation processes. In FY 2023 CDAO AI Assurance will also continue to transform the current Test and Evaluation Master Plan (TEMP) to a Digital TEMP, reducing development time of the TEMP, and increasing usefulness of the TEMP through fully integrated Digital Engineering (DE) processes. The CDAO Enterprise Platforms and Capabilities team will work with Advana, the Joint Common Foundation (JCF), SUNet, VAULT, DI2E, PlatformOne, CloudOne, Navy Black Pearl, Maven, COEUS, and DoD HPCs to develop a long-term strategy to ensure the JCF and Fabric development efforts meet the Department's needs. The CDAO will take the critical, tested and proven enterprise platforms and capabilities, such as access controls, data and service integration, and AI/MLOps pipeline to continue development of foundational services to be shared and used by the Department. This effort will facilitate the creation a superhighway of countless platforms and systems to move data, analytics, capabilities, and integrate enterprise services to enable the acceleration of AI across the Department.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 5		R-1 Program Element (Number/Name) PE 0604123D8Z / <i>Chief Digital Artificial Intel ligence Officer</i>		Project (Number/Name) 067 / <i>AI/ML Demonstration & Validation</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Effective February 1, 2022 the DoD established the position of the CDAO and the OCDAO, tasked with serving as the Department's senior official, and a Principal Staff Assistant, responsible for strengthening and integrating data, artificial intelligence, and digital solutions. The transfer in (\$158.062 from DISA, JAIC program and \$0.770 from WHS DDS) supports the consolidation of the Department's existing functional efforts in order to align manpower and funding resources under the OCDAO.					
Title: Artificial Intelligence and Data Accelerator			0.000	-	76.790
<p>Description: ADA is a DSD initiative to accelerate the deployment of data-enabled automation platform and development capabilities to each CCMD. ADA is designed to help CCMDs determine their long-term data and AI capability and needs and whether existing platforms can be scaled to address them. This funding addresses the AI component of ADA which will enable AI capability development and demonstration across three subcomponents: AI-Enabled Joint Operating System; CCMD Experimentation; and AI Integration Service Programs.</p> <p>ADA is a three-year effort (FY 2022-2024) directed by the DSD to accelerate the deployment of data- enabled automation platforms and development capabilities to each CCMD. It is designed to transform how CCMDs conduct globally-integrated data management, including both warfighting and business decision analytics, and provide a data foundation to enable workflow and command and control automation capabilities. ADA is a campaign of learning to identify data and joint all domain command and control (JADC2) operational needs, discover obstacles to implementation of modern capabilities, and develop joint solutions. The ADA initiative is led by the Department's new CDAO.</p> <p>FY 2023 Plans: In FY 2023, CDAO plans to continue to build ADA support personnel and partnerships to solve data, process, and infrastructure challenges at scale. ADA accomplishes this via on-site data personnel to augment CCMD capabilities, access to artificial intelligence (AI) experts to deploy tailored process solutions, deep reach back to DoD enterprise services, and close integration with the JADC2 experimentation community. ADA seeks to learn fast and scale outcomes broadly. As effective solutions are developed in one CCMD, they will be made available across the enterprise for further development and implementation. ADA is not solely focused on capability delivery, but designed to address both materiel and non-materiel challenges to data management. ADA discovery efforts across a range of capability areas including workforce development, acquisition practices, software modernization, IT infrastructure, and outdated processes are included. The ADA team will provide recommendations to the CDAO, JADC2 partners, and other governance bodies as appropriate.</p> <p>The ADA plan envisions a modest level of data management support for each CCMD by deploying the Advana and Project Maven platforms to each CCMD and the Joint Staff and embedding teams of data, analytics, and AI experts within the CCMDs to identify and resolve use cases.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 5		R-1 Program Element (Number/Name) PE 0604123D8Z / <i>Chief Digital Artificial Intelligence Officer</i>		Project (Number/Name) 067 / <i>AI/ML Demonstration & Validation</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Effective February 1, 2022 the Department of Defense established the position of the CDAO and the OCDAO, tasked with serving as the Department's senior official, and a Principal Staff Assistant, responsible for strengthening and integrating data, artificial intelligence, and digital solutions. This \$76.790M in new growth supports the consolidation of the Department's existing functional efforts in order to align manpower and funding resources under the OCDAO.					
Title: Joint Artificial Intelligence (AI) Test and Evaluation (T&E) Infrastructure Capability (JATIC) Description: On May 26, 2021, the DSD published a memo on Responsible AI directed "establishing a test and evaluation and verification framework that integrates real-time monitoring, algorithm confidence metrics, and user feedback to ensure trusted and trustworthy AI capabilities." The JAITIC will enable enterprise-scale rapid development, testing, and deployment of AI capabilities across warfighter domains and will migrate the DoD towards Joint All Domain Test & Evaluation in support of JADO. This funding is earmarked for 4 of the 23 programs that establish the JATIC foundation; Adversarial AI T&E, AI/ML model card standards, Scalable AI Test Harness, CDAO data repository, data service marketplace, and ontologies. FY 2023 Plans: In FY 2023, CDAO plans to develop Adversarial AI Test & Evaluation capabilities, AI/ML model card standards, the Scalable AI Test Harness, the CDAO data repository, data service marketplace and enterprise ontologies. FY 2022 to FY 2023 Increase/Decrease Statement: Effective February 1, 2022 the DoD established the position of the CDAO and the OCDAO, tasked with serving as the Department's senior official, and a Principal Staff Assistant, responsible for strengthening and integrating data, artificial intelligence, and digital solutions. This \$12.727M in new growth supports the consolidation of the Department's existing functional efforts in order to align manpower and funding resources under the OCDAO and will address the May 26, 2021, DSD memo on Responsible AI, which directed "establishing a test and evaluation and verification framework that integrates real-time monitoring, algorithm confidence metrics, and user feedback to ensure trusted and trustworthy AI capabilities."			0.000	-	12.727
Title: Establishment of the Chief Digital and Artificial Intelligence Officer - Advana Description: On December 8, 2021, the DSD issued a memo establishing the CDAO as the Department's senior official responsible for strengthening and integrating data, artificial intelligence, and digital solutions in the Department. The memorandum establishes the CDAO as the "successor organization to the JAIC". The CDAO reached IOC on February 1, 2022 and will integrate the JAIC, the DDS, the OCDO, and Advana as it approaches FOC on June 1, 2022. The integration of the JAIC, OCDO, DDS, and Advana into the CDAO more comprehensively restructures how the Department approaches the complex and dynamic challenges of becoming a digital, data, and Artificial Intelligence (AI) enabled enterprise capable of operating at the speed and scale necessary to accelerate the Department's adoption of data, analytics, and AI to generate decision advantage.			0.000	-	23.091

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604123D8Z / <i>Chief Digital Artificial Intel ligence Officer</i>	Project (Number/Name) 067 / <i>AI/ML Demonstration & Validation</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>The functions of the CDAO are as follows: lead and oversee DoD’s strategy development and policy formulation for data, analytics, and AI; break down barriers to data and AI adoption within DoD institutional processes; create enabling digital infrastructure and services that support Components’ development and deployment of data, analytics, AI, and digital-enabled solutions; selectively scale proven digital and AI-enabled solutions focused on enterprise and joint use cases; and surge digital services for rapid response to crises and emergent challenges. This also requires CDAO to integrate the capabilities, personnel, resources, and governance of its constituent organizations, while concurrently sustaining momentum on priority projects that align to CDAO’s mission. These include expanding the enterprise data repository; establishing a responsible AI ecosystem; executing the ADA initiative; and developing a Data, Analytics, and AI Adoption Strategy. These various lines of effort will support the overarching mission of accelerating the Department’s adoption of data, analytics, and AI to preserve decision advantage across the Joint Force.</p> <p>This request provides funding for Advana to fulfill the Creating Data Advantage memo signed by the DSD (5 May 2021) to be the single authoritative source for enterprise data management and analytics for the Department’s senior leaders. The ensuing growth in users, data, and analytic output requires additional funding to operate and sustain Advana to provide decision advantage. Since November 2021, the Advana Incident Response Decision Support Cell team, in partnership with the Joint Staff, EUCOM, TRANSCOM, Services, Defense Manpower Data Center, and others have been establishing the foundation of a data driven Incident Response Capability. This tool suite enables Senior Leaders near real time awareness of the entire deployment process (planning stage through execution to closure) for people, equipment, and supplies within a specific Area of Responsibility. The crisis in Ukraine created a critical, time-sensitive demand for further rapid data aggregation and ongoing development support to inform senior leader decision-making on deployment of personnel and equipment, including Non-Combatant Evacuation, COVID-19 protection measures, and humanitarian aid, among other potential problem sets. Additional service support resources are needed to sustain 24/7 operating demands required for future incidents, as well as sustaining globally distributed staff embedded within several Combatant Commands. This work also results in additional infrastructure, license, and labor costs. Advana must also expand to environments such as (Joint Worldwide Intelligence Communication System) to support data needs and operations at higher classification levels. The benefit of having preplanned, established frameworks and mechanisms for data interoperability between DoD components and other agencies can increase speed to insight and relevance for critical information necessary for time constrained decision support.</p> <p>FY 2023 Plans: In FY 2023, the CDAO will continue to make progress in transforming the Department through AI, and understanding the importance of remaining agile and adapting to meet its diverse needs.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604123D8Z / <i>Chief Digital Artificial Intel ligence Officer</i>	Project (Number/Name) 067 / <i>AI/ML Demonstration & Validation</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
Effective February 1, 2022 the DoD established the position of the CDAO and the OCDAO, tasked with serving as the Department's senior official, and a Principal Staff Assistant, responsible for strengthening and integrating data, artificial intelligence, and digital solutions. This realignment of \$23.091M supports the consolidation of the Department's existing functional efforts in order to align manpower and funding resources under the OCDAO.			
Accomplishments/Planned Programs Subtotals		0.000	-
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy The CDAO acquisition, management, and contracting strategy follows guidance outlined in the DoD 5000 series directives, Federal Acquisition Regulation (FAR) and FAR supplement policies and procedures. Management uses project management tools and meetings to ensure delivery of stated capabilities and performance criteria.			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022		
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0604123D8Z / <i>Chief Digital Artificial Intelligence Officer</i>				Project (Number/Name) 067 / <i>AI/ML Demonstration & Validation</i>				

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/Various	TBD : TBD	-	-		-		273.340		-		273.340	Continuing	Continuing	-
Subtotal			-	-		-		273.340		-		273.340	Continuing	Continuing	N/A

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-	-	273.340	-	273.340	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense							Date: April 2022			
Appropriation/Budget Activity 0400 / 5				R-1 Program Element (Number/Name) PE 0604123D8Z / <i>Chief Digital Artificial Intel ligence Officer</i>				Project (Number/Name) 067 / <i>AI/ML Demonstration & Validation</i>		

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Artificial Intelligence and Data Accelerator																												
ADA																												
CDAO: Building Resiliency and Readiness (USD(P&R)) ADVANA																												
CDAO: Building Resiliency and Readiness (USD(P&R)) ADVANA																												
Joint Artificial Intelligence (AI) Test and Evaluation (T&E) Infrastructure Capability (JATIC)																												
Joint Artificial Intelligence (AI) Test and Evaluation (T&E) Infrastructure Capability (JATIC)																												
Establishment of the Chief Digital and Artificial Intelligence Officer - Advana																												
Advana																												
Establishment of the Chief Digital and Artificial Intelligence Officer																												
CDAO																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604123D8Z / <i>Chief Digital Artificial Intelligence Officer</i>	Project (Number/Name) 067 / <i>AI/ML Demonstration & Validation</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Artificial Intelligence and Data Accelerator</i>				
ADA	4	2022	3	2024
<i>CDAO: Building Resiliency and Readiness (USD(P&R)) ADVANA</i>				
CDAO: Building Resiliency and Readiness (USD(P&R)) ADVANA	4	2022	3	2027
<i>Joint Artificial Intelligence (AI) Test and Evaluation (T&E) Infrastructure Capability (JATIC)</i>				
Joint Artificial Intelligence (AI) Test and Evaluation (T&E) Infrastructure Capability (JATIC)	4	2022	3	2027
<i>Establishment of the Chief Digital and Artificial Intelligence Officer - Advana</i>				
Advana	4	2022	3	2027
<i>Establishment of the Chief Digital and Artificial Intelligence Officer</i>				
CDAO	4	2022	3	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604161D8Z / <i>Nuclear and Conventional Physical Security/National Technical Nuclear Forensics</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	89.495	7.045	5.650	6.482	-	6.482	6.521	14.515	13.917	16.569	-	-
163: <i>Nuclear and Conventional Physical Security</i>	73.445	7.045	5.650	6.482	-	6.482	6.521	6.011	5.244	6.243	-	-
042: <i>National Technical Nuclear Forensics / System Development & Demonstration (SDD)</i>	16.050	0.000	0.000	0.000	-	0.000	0.000	8.504	8.673	10.326	-	-

Note

New Start (Y/N): No

Funding transferred from Countering Nuclear Threats (CNT) to National Technical Nuclear Forensics (NTNF), P041. In fiscal year 2018, Departments and Agencies began to shift research and development from NTNF to other mission areas. This resulted in degradation of the Department of Defense's (DoD) (and by default, the U.S. Government's (USG)) already limited ability to effectively and reliably execute the nuclear forensics mission. As the lead for providing the USG's post-detonation nuclear forensics capability, the DoD is emphasizing the importance of this mission in deterring adversaries and ensuring success of the USG's post-detonation NTNF mission.

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression, Defend the Homeland, Provide Nuclear Deterrence, and Build Sustainable and Long-Term Advantage.

Nuclear and Conventional Physical Security/National Technical Nuclear Forensics addresses the need to defend and deter against weapons of mass destruction threats and to safeguard personnel; prevent unauthorized access to equipment, installations, material, and documents; and to safeguard the foregoing against espionage, sabotage, damage, and theft. This program oversees advanced engineering development and rapid fielding throughout the DoD for an integrated and systemic approach for National Technical Nuclear Forensics and the development of nuclear and conventional physical security material solutions. Public Law, Presidential and DoD-level guidance, and Combatant Command and Service requirements drive the priorities for these programs.

Funding associated with nuclear and conventional physical security materiel solutions for the Department are broken down into seven capability areas: (1) Detection and Assessment; (2) Access Controls; (3) Installation and Transport Security; (4) Storage and Safeguards; (5) Prevention; (6) Decision Support Systems; and (7) Analytical Support. The material solutions either (a) lead to a Program of Record, (b) become technology insertions into existing programs; or (c) advance to being a certified Commercial/Government off-the-shelf product. The Physical Security Enterprise and Analysis Group (PSEAG) is responsible for avoiding duplication of effort, ensuring systems integration, and promoting interoperability and sustainability.

Per Presidential Policy Directive 42, Annex C, the DoD provides the USG post-detonation NTNF capability. Per DoDD 2060.04, the Office of the Undersecretary of Defense for Acquisition & Sustainment (OUSD(A&S)) is the office responsible for developing and leading the DoD's NTNF capabilities. Ensuring the USG can

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604161D8Z I <i>Nuclear and Conventional Physical Security/National Technical Nuclear Forensics</i>
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identify the source of nuclear material and hold those responsible for an attack accountable is critical to our national defense and security. Internal and independent assessments indicate new capabilities are needed to sustain an effective deterrent against nuclear attack and meet the challenges of future threats. This PE is the only DoD Research Development Test & Evaluation (RDT&E) program focused on System Development & Demonstration of post-detonation NTNF capabilities and without proper funding, the DoD's ability to meet this critical deterrence need will be significantly degraded.

This PE can fund travel to support the requirements of this program.

This appropriation will finance work, including staffing, performed by a government agency or by private individuals or organizations under a contractual or grant arrangement with the government who conduct research, development, and test and evaluation efforts.

B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	7.169	5.682	0.000	-	0.000
Current President's Budget	7.045	5.650	6.482	-	6.482
Total Adjustments	-0.124	-0.032	6.482	-	6.482
• Congressional General Reductions	-	-0.032			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.124	-			
• Adjustments to Budget Year	-	-	6.482	-	6.482

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0604161D8Z / Nuclear and Convention al Physical Security/National Technical Nucl ear Forensics				Project (Number/Name) 163 / Nuclear and Conventional Physical Security			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
163: Nuclear and Conventional Physical Security	73.445	7.045	5.650	6.482	-	6.482	6.521	6.011	5.244	6.243	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
Funding associated with nuclear and conventional physical security materiel solutions for the Department are broken down into seven capability areas: (1) Detection and Assessment; (2) Access Controls; (3) Installation and Transport Security; (4) Storage and Safeguards; (5) Prevention; (6) Decision Support Systems; and (7) Analytical Support. The material solutions either (a) lead to a Program of Record, (b) become technology insertions into existing programs; or (c) advance to being a certified Commercial/Government off-the-shelf product. The Physical Security Enterprise and Analysis Group (PSEAG) is responsible for avoiding duplication of effort, ensuring systems integration, and promoting interoperability and sustainability.												
This PE can fund travel to support the requirements of this program.												
This appropriation will finance work, including staffing, performed by a government agency or by private individuals or organizations under a contractual or grant arrangement with the government who conduct research, development, and test and evaluation efforts.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: Detection and Assessment									4.045	2.470	4.762	
Description: The ability to detect an adversary and assess their intentions is a basic physical security tenant. This capability area will design equipment to identify and warn of unauthorized access to a specified area or installation, as well as equipment related to the notification and identification of explosive threats or hazards.												
Accomplishment: The PSEAG and the National Nuclear Security Administration jointly developed a Portable Intrusion Detection System (PIDS) that addresses similar needs to protect nuclear weapons and special nuclear material. PIDS will provide a stable sensor platform that maintains the integrity of an existing secure perimeter in the event of sensor maintenance or system downtime. These include, but are not limited to, scheduled maintenance and upgrade activities for extended periods of time, or during emergency situations requiring the establishment of a National Defense Area; and mission requirements that dictate deployment of nuclear certified assets to locations that do not meet nuclear security requirements.												
FY 2022 Plans:												

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604161D8Z / <i>Nuclear and Conventional Physical Security/National Technical Nuclear Forensics</i>	Project (Number/Name) 163 / <i>Nuclear and Conventional Physical Security</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> • Evaluate at least three commercial off-the-shelf systems, with an option of an additional three systems, that claim to detect trace energetic materials and are often employed for Entry Control Point screening. • Develop a differential Short Wave Infrared-based technology for the standoff detection of concealed explosives that is also capable of identifying the concealed explosive threat • Integrate a GOTS or COTS sonar capability in response to emergent waterside security requirements within the INDOPACOM / NORTHCOM areas of responsibility. <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> • Develop and demonstrate a cross-domain system for full-spectrum defeat of unmanned vehicles. These threats include unmanned surface vehicles, unmanned undersea vehicles, and unmanned aerial vehicles. • Improve classification and assessment to underwater targets achieved through creating detailed images. • Develop an integrated, jointly optimized long range face recognition system weighing less than 30 lbs and capable of matching in real time facial imagery acquired at long ranges against large scale galleries/watch lists. • Develop and integrate a small form-factor, low power, high resolution sonar for the Sonar Navigated Autonomous Grabber vehicle to increase interdiction capability/performance in turbid water conditions. <p>FY 2022 to FY 2023 Increase/Decrease Statement: The FY 2022 to FY 2023 increase is the result of planned internal program adjustments based on Combatant Command and Military Services needs.</p>			
<p>Title: Access Controls</p> <p>Description: Controlling access to safeguard personnel and their families and to prevent unauthorized access to critical infrastructure and materials is paramount. This capability area will focus on programs and processes related to the validity and verification of individuals entering or already within, a facility.</p> <p>Accomplishment: Defense Installation Access Control project enhances the Identity Matching Engine for Security & Analysis used at hundreds of DoD entry control points to compare Personal Identity Verification/Common Access Card holders against the National Crime Information Center and the Interstate Identification Index. Previous work developed a capability that compares DoD registered cardholders against the FBI's Wanted Persons File and against the Terrorist Screening Database. This capability prevents un-cleared people or potential terrorists from entering DoD installations. The updated system identified an individual with warrants for murder and aggravated assault with a deadly weapon trying to get installation access.</p> <p>FY 2022 Plans:</p>		0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604161D8Z / Nuclear and Conventional Physical Security/National Technical Nuclear Forensics	Project (Number/Name) 163 / Nuclear and Conventional Physical Security	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> The Combatant Commands and the Services did not identify any material needs for this Budget Activity/Capability Area. FY 2023 Plans: <ul style="list-style-type: none"> The Combatant Commands and the Services did not identify any material needs for this Budget Activity/Capability Area. FY 2022 to FY 2023 Increase/Decrease Statement: No change			FY 2023
Title: Installation and Transport Security Description: Robust installation and transport security are vital to preventing a weapon of mass destruction attack or the unauthorized access to key assets such as nuclear weapons and special nuclear material. This capability area will focus on programs and equipment intended to improve the physical security profile of fixed sites and facilities, as well as critical items while in-transit. Accomplishment: Joint Active Shooter Protection and Response project integrates sensors to automatically detect indoor gunshots; provides potential victims, responders and authorized personnel with information to enhance situational awareness; and enable automatic or manual control of the building - inhibiting the shooter - shortening the duration of an active shooter incident. FY 2022 Plans: <ul style="list-style-type: none"> Develop a Waterside Defensive System to counter threats in naval ports, above, on, and below the surface. The system will be fully integrated and monitored and controlled from the Installation Defense Operations Center. FY 2023 Plans: <ul style="list-style-type: none"> The Combatant Commands and the Services did not identify any material needs for this Budget Activity/Capability Area. FY 2022 to FY 2023 Increase/Decrease Statement: FY 2022 to FY 2023 decrease is the result of an internal realignment of funds within the department for National Defense Strategy priorities and Combatant Command and Military Services needs.		0.000	1.461
Title: Prevention Description: The security procedures taken to discourage an adversary from accessing weapons of mass destruction or gaining unauthorized access to critical assets are at the heart of prevention. This capability area will focus on broad spectrum, generic efforts which have the ability to influence multiple areas.		0.000	1.719
			0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604161D8Z / <i>Nuclear and Conventional Physical Security/National Technical Nuclear Forensics</i>	Project (Number/Name) 163 / <i>Nuclear and Conventional Physical Security</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>Accomplishment: Develop a Small Arms Point Defense System to integrate and test increasing levels of technological sophistication of fire control and stabilization to find affordability and effectiveness for kinetic, low collateral damage, C-UAS applications.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> • Complete the review requirements, procure, perform suitability testing, implement design improvements, and demonstrate a fieldable stabilized crew-served heavy machine gun mount for naval applications. • Fully develop the prototype Sonar Navigated Autonomous Grabber Unmanned Underwater Vehicle (UUV) for autonomous swimmer/diver and UUV interdiction. <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> • The Combatant Commands and the Services did not identify any material needs for this Budget Activity/Capability Area. <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2022 to FY 2023 decrease is the result of an internal realignment of funds within the department for National Defense Strategy priorities and Combatant Command and Military Services needs.</p>			
<p>Title: Storage and Safeguards</p> <p>Description: Properly securing critical assets to prevent access by unauthorized persons and implementing control measures that ensure access is limited to authorized persons is the foundation of physical security. This capability area will focus on equipment (e.g., locks, doors, etc.) designed to delay or stop unauthorized entry/access to a specified/localized area.</p> <p>Accomplishment: Combatant Commands and Service requirements did not dictate the need for System Development and Demonstration.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> • The Combatant Commands and the Services did not identify any material needs for this Budget Activity/Capability Area. <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> • The Combatant Commands and the Services did not identify any material needs for this Budget Activity/Capability Area. <p>FY 2022 to FY 2023 Increase/Decrease Statement: No change</p>		0.000	0.000
Title: Decision Support Systems		3.000	0.000
			0.475

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604161D8Z / <i>Nuclear and Conventional Physical Security/National Technical Nuclear Forensics</i>	Project (Number/Name) 163 / <i>Nuclear and Conventional Physical Security</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Description: Decision support systems serve the management, operations, and planning levels of the DoD physical security enterprise to help to make decisions, which may be rapidly changing and not easily specified in advance. This capability area will focus on command and control equipment, projects related to the creation and enhancement of common operating pictures, and the establishment of common architectures / interface standards.</p> <p>Accomplishment: Platform for Integrated Command, Control, and Communications and Responsive Defense (PICARD) project developed a next generation security system using an open fusion annunciator, a secure cloud infrastructure and integration with a mobile Common Operating Picture, to create a cost-effective sensor platform. This capability will eventually replace antiquated security systems that are based on high cost sensor technology with low-cost sensors used in fields like the automotive industry.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> • The Combatant Commands and the Services did not identify any material needs for this Budget Activity/Capability Area. <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> • Develop a modular Artificial Intelligence platform that intelligently fuses multiple data sources to aid in the decision making in response to installation hazards and threats. Use machine learning and predictive analysis to mitigate emerging threats that may degrade installation operations and increase Command-level as well as National awareness. <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p> <p>The FY 2022 to FY 2023 increase is the result of an internal realignment of funds within the department for National Defense Strategy priorities and Combatant Command and Military Services needs.</p>				
<p>Title: Analytical Support</p> <p>Description: This capability area will focus on studies related to physical security topics and operational and management efforts related to day-to-day activities of the DoD Physical Security Enterprise RDT&E Program.</p> <p>Accomplishment: The Maritime Expeditionary & Transit Security project demonstrated and evaluated how advanced non-lethal weapons technology employed for extended range will enhance and improve response capabilities for the transit protection mission. This project also determined how a flexible and scalable precision fire weapons system capability enhances/augments the current use of crew served weapons to counter fast approaching surface threats during High Value Unit transits.</p> <p>FY 2022 Plans:</p>		0.000	0.000	1.245

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> • The Combatant Commands and the Services did not identify any material needs for this Budget Activity/Capability Area. FY 2023 Plans: <ul style="list-style-type: none"> • Develop tools to analyze potential vulnerabilities of a location in relation to terrorist attacks. FY 2022 to FY 2023 Increase/Decrease Statement: The FY 2022 to FY 2023 increase is the result of an internal realignment of funds within the department for National Defense Strategy priorities and Combatant Command and Military Services needs.			
Accomplishments/Planned Programs Subtotals		7.045	5.650
C. Other Program Funding Summary (\$ in Millions) N/A Remarks NA D. Acquisition Strategy N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022					
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0604161D8Z / Nuclear and Convention al Physical Security/National Technical Nucl ear Forensics						Project (Number/Name) 163 / Nuclear and Conventional Physical Security					
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total					
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract		
Physical Security - Product Development Prior Years	Various	Various : Various	52.256	-		-		4.473		-		4.473	-	-	-		
Indoor Gunshot Detection System	MIPR	SPAWAR Atlantic : Charleston, SC	0.926	-		-		-		-		-	-	-	-		
Trace Explosive Detection System Improvement	MIPR	EOD Tech Division : Indian Head, MD	1.352	-		-		-		-		-	-	-	-		
Stabilized Crew-Served Heavy Machine Gun Mount	MIPR	NSWC Crane : Crane, IN	0.329	-		-		-		-		-	-	-	-		
JIGSAW - TASS Integration	MIPR	Multiply Performers : Multiple Locations	1.383	-		-		-		-		-	-	-	-		
Platform for Integrated C3 and Responsive Defense	MIPR	Air Force Technical Applications : Patrick AFB, Florida	3.000	3.000		-		-		-		-	-	-	-		
Joint Expeditious Subsurface-threat Sonar Capability	MIPR	Multiple Performers : Multiple locations	-	-		0.849		-		-		-	Continuing	Continuing	-		
Sonar Navigated Autonomous Grabber	MIPR	Multiple Performers : Multiple Locations	-	-		0.831		1.000		-		1.000	Continuing	Continuing	-		
Small Arms Point Defense	MIPR	Multiple Performers : Multiple Locations	-	-		0.750		-		-		-	Continuing	Continuing	-		
Waterside Defensive System	MIPR	Multiple Performers : Multiple Locations	-	-		1.494		-		-		-	Continuing	Continuing	-		
Subtotal			59.246	3.000		3.924		5.473		-		5.473	Continuing	Continuing	N/A		
Remarks NA																	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0604161D8Z / Nuclear and Convention al Physical Security/National Technical Nucl ear Forensics				Project (Number/Name) 163 / Nuclear and Conventional Physical Security					
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Physical Security - Test & Evaluation Prior Years	Various	Multiple : Multiple	3.600	-		-		1.009		-		1.009	-	-	-
PSEAG T&E	MIPR	SPAWAR Atlantic : Charleston, SC	0.896	-		-		-		-		-	-	-	-
Comparative Colorimetric	MIPR	EOD Tech Division : Indian Head, MD	2.087	-		-		-		-		-	-	-	-
Stand-Off Weapon Defeat IPT	MIPR	NSWC Dahlgren Division : Dahlgren Division	1.434	-		-		-		-		-	-	-	-
C-UAS in the Homeland	MIPR	Multiple Performers : Multiple Locations	1.372	-		-		-		-		-	-	-	-
PSEAG Test & Evaluation	MIPR	NIWC Atlantic : Charleston, SC	1.225	4.045		-		-		-		-	-	-	-
Enhancing Biosecurity Surveillance	MIPR	USAMRIID : Fort Detrick, MD	0.270	-		-		-		-		-	-	-	-
Conventional X-ray for EOD Applications T&E	MIPR	EOD Tech Division : Indian Head, MD	0.569	-		-		-		-		-	-	-	-
Handheld Backscatter X-ray T&E	MIPR	EOD Tech Division : Indian Head, MD	0.798	-		-		-		-		-	-	-	-
Bulk Standoff T&E	MIPR	EOD Tech Division : Indian Head, MD	0.663	-		-		-		-		-	-	-	-
Surface Enhanced Raman Spectroscopy T&E	MIPR	EOD Tech Division : Indian Head, MD	0.856	-		-		-		-		-	-	-	-
Millimeter-Wave Onsite Evaluation	MIPR	EOD Tech Division : Indian Head, MD	0.429	-		-		-		-		-	-	-	-
Trace Comparative	MIPR	EOD Tech Division : Indian Head, MD	-	-		0.895		-		-		-	Continuing	Continuing	-
Standoff Suicide Bomber Detection Development	MIPR	EOD Tech Division : Indian Head, MD	-	-		0.831		-		-		-	Continuing	Continuing	-
Subtotal			14.199	4.045		1.726		1.009		-		1.009	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0604161D8Z / Nuclear and Convention al Physical Security/National Technical Nucl ear Forensics					Project (Number/Name) 163 / Nuclear and Conventional Physical Security				

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks NA															
			Prior Years	FY 2021	FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals			73.445	7.045		5.650		6.482		-		6.482	Continuing	Continuing	N/A
Remarks NA															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604161D8Z / Nuclear and Conventional Physical Security/National Technical Nuclear Forensics	Project (Number/Name) 163 / Nuclear and Conventional Physical Security



PSEAG REQUIREMENTS PROCESS





Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604161D8Z / Nuclear and Conventional Physical Security/National Technical Nuclear Forensics	Project (Number/Name) 163 / Nuclear and Conventional Physical Security

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Nuclear and Conventional Physical Security R&D				
Various physical security R&D efforts to address Combatant Command and Service Needs	1	2023	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0604161D8Z / Nuclear and Convention al Physical Security/National Technical Nucl ear Forensics				Project (Number/Name) 042 / National Technical Nuclear Forensics / System Development & Demonstration (SDD)			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
042: National Technical Nuclear Forensics / System Development & Demonstration (SDD)	16.050	0.000	0.000	0.000	-	0.000	0.000	8.504	8.673	10.326	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Funding transferred from CNT to NTNF, P041. In fiscal year FY 2018, Departments and Agencies began to shift research and development from NTNF to other mission areas. This resulted in degradation of the DoD's (and by default, the USG's) already limited ability to effectively and reliably execute the nuclear forensics mission. As the lead for providing the U.S. Government's post-detonation nuclear forensics capability, the DoD is emphasizing the importance of this mission in deterring adversaries and ensuring success of the USG's post-detonation NTNF mission.

Prior Year, FY 2020, and FY 2021 funding is associated with the CNT program.

A. Mission Description and Budget Item Justification

Per Presidential Policy Directive 42, Annex C, the DoD provides the USG's post-detonation NTNF capability. Per DoDD 2060.04, the OUSD(A&S) is the DoD office responsible for DoD's NTNF capabilities. This program is the only DoD RDT&E program focused on System Development & Demonstration development of NTNF capabilities.

Ensuring the USG can identify the source of nuclear material and hold those involved or supporting an attack accountable is critical to our national defense and security. Swift and accurate forensic and attribution (identification) capabilities are vital to supporting the President and Secretary of Defense in developing an appropriate, timely national response to a nuclear event and to prevent future attacks. An effective attribution capability ensures potential adversaries know that they will be held accountable if they use proxies or other non-traditional delivery of nuclear weapons against the U.S., U.S. interests, or allies. Both internal and independent studies indicate that continued improvement to USG NTNF capabilities is needed to sustain a credible deterrent against an attempted or actual nuclear attack.

Additionally, this program sustains perishable U.S. technical expertise at the operational DoD laboratories required to respond to a post-detonation NTNF event. DoD's laboratory capability in this area is limited by capacity and technical expertise. In FY 2018, Departments and Agencies began to shift research and development from NTNF to other mission areas, which resulted in degradation of the DoD's (and by default, the USG's) ability to execute the nuclear forensics mission and deter adversaries through the attrition of technical experts vital to the response. Sustained support of the DoD's NTNF mission is crucial to not only preventing attrition of current capabilities and knowledge base, but in ensuring that this critical and unique deterrence capability is not lost, putting the security of the nation and the ability to deter specific kinds of nuclear attack at risk.

This PE can fund travel to support the requirements of this program.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 5		R-1 Program Element (Number/Name) PE 0604161D8Z / Nuclear and Conventional Physical Security/National Technical Nuclear Forensics	Project (Number/Name) 042 / National Technical Nuclear Forensics / System Development & Demonstration (SDD)		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>Title: NTNF Capability Development</p> <p>Description: The development of capability to identify the source of nuclear material from radioactive debris is critical to our national defense and security. Swift and accurate forensic and attribution (identification) capabilities are vital to supporting the President and Secretary of Defense in developing an appropriate national response to a nuclear event and to prevent future attacks in a timely manner.</p> <p>NTNF investments support development and retention of technical nuclear forensics expertise, improve the fixed laboratory process, improving legacy NTNF capabilities, and supporting operationalization of new capabilities.</p> <p>FY 2022 Plans: There are no System Development & Demonstration requirements until FY 2025.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: N/A</p>			0.000	0.000	-
<p>Title: Countering Nuclear Threats</p> <p>Description: Funding transferred from CNT mission to NTNF, P041. This decision affects Program Elements 0603161D8Z and 0604161D8Z by eliminating the CNT program. NTNF, P041, was added to this Program Element to address System Development & Demonstration requirements.</p> <p>NOTE: Prior Year, FY 2020, and FY 2021 funding is associated with the CNT program.</p> <p>FY 2022 Plans: Funding transferred to NTNF PE 0603161D8Z.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Decrease in funding is associated with the elimination of the CNT program.</p>			0.000	0.000	-
Accomplishments/Planned Programs Subtotals			0.000	0.000	-
C. Other Program Funding Summary (\$ in Millions)					
N/A					
Remarks					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604161D8Z / Nuclear and Convention al Physical Security/National Technical Nucl ear Forensics	Project (Number/Name) 042 / National Technical Nuclear Forensics / System Development & Demonstration (SDD)
D. Acquisition Strategy N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022		
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0604161D8Z / Nuclear and Convention al Physical Security/National Technical Nucl ear Forensics				Project (Number/Name) 042 / National Technical Nuclear Forensics / System Development & Demonstration (SDD)				

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
NTNF	TBD	TBD : TBD	-	-		-		-		-		-	Continuing	Continuing	-
CNT	Sub Allot	JPEO CBD : Aberdeen, MD	16.050	0.000		-		-		-		-	-	-	-
Subtotal			16.050	0.000		-		-		-		-	Continuing	Continuing	N/A

Remarks
 NTNF SDD requirements begin in FY 2025

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	16.050	0.000	-	-	-	-	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604161D8Z / Nuclear and Convention al Physical Security/National Technical Nucl ear Forensics	Project (Number/Name) 042 / National Technical Nuclear Forensics / System Development & Demonstration (SDD)	

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
NTNF SDD																												
NTNF SDD																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604161D8Z / Nuclear and Conventional Physical Security/National Technical Nuclear Forensics	Project (Number/Name) 042 / National Technical Nuclear Forensics / System Development & Demonstration (SDD)	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
NTNF SDD				
NTNF SDD	4	2021	4	2026

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 5: System Development & Demonstration (SDD)</i>					R-1 Program Element (Number/Name) PE 0604165D8Z I <i>Prompt Global Strike Capability Development</i>							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	99.233	89.156	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	-	-
065: <i>Joint Hypersonics</i>	99.233	89.156	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	-	-

Note

New Start (Y/N): No

Beginning in FY 2022 Joint Hypersonics Transition Office (JHTO) activities will be administered through the newly-created Joint Hypersonic Technology Development & Transition Program Element (PE) (0603183D8Z), a budget activity three (BA-3) PE. The new PE better aligns to the intended budget activity, the JHTO mission, and congressional intent.

In FY 2020 and FY 2021, the Joint Hypersonics Transition Office (JHTO) was funded via Congressional Add to better synchronize hypersonic technology development and workforce development. Those funds were administered through the Prompt Global Strike Capability Development Program Element (PE) - (0604165D8Z), a budget activity five (BA-5) PE. In FY 2022, the Office of the Secretary of Defense established the Joint Hypersonic Technology Development & Transition Program Element (0603183D8Z), a budget activity three (BA-3) PE, to administer JHTO funds. The new PE better aligns to the intended budget activity, the JHTO mission, and congressional intent.

A. Mission Description and Budget Item Justification

This Program Element (PE) was established to develop and demonstrate technologies and applications that advance Conventional Prompt Global Strike (CPGS) warfighting capabilities. The program uses a national team with participation from multiple Services, Agencies, national research laboratories, and industry partners selected on a competitive basis. Program emphasis is on demonstrating component and subsystem technology maturity with risk reduction initiatives highlighted by flight tests. The program funds the design, development, and experimentation of boosters, payload delivery vehicles (PDVs), non-nuclear warheads, thermal protection systems, guidance systems, test range modernization, and mission planning and enabling capabilities. To support these development activities, the program procures modeling and simulation capabilities, ground testing, command and control interfaces, test range support, and launch system infrastructure. Additionally, expert resources address strategic policy and treaty issues. Flight and ground test outcomes drive program timing and DoD hypersonic budget investments.

The Prompt Global Strike Capability Development Program Element supports the National Defense Strategy's focus on technological advancements that enhance deterrence and increase strategic flexibility, freedom of action, and Joint Force lethality.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604165D8Z I <i>Prompt Global Strike Capability Development</i>
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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	89.863	0.000	0.000	-	0.000
Current President's Budget	89.156	0.000	0.000	-	0.000
Total Adjustments	-0.707	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.689	-			
• Other Program Adjustments	-0.018	-	-	-	-

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 065: Joint Hypersonics

Congressional Add: *University Consortium for Applied Hypersonics*

Congressional Add: *HyFly2 Initial Risk Mitigation Program*

Congressional Add: *Navigation, Guidance and Controls (NGC) Science and Technology Development*

Congressional Add: *Propulsion Science and Technology Development*

Congressional Add: *Systems Engineering, Design and Analysis (SEDA) Science and Technology Development*

Congressional Add: *Materials, Structures and Manufacturing (MSM) Science and Technology Development*

Congressional Add: *Ordnance Science and Technology Development*

Congressional Add: *Mission Planning Science and Technology Development*

Congressional Add: *Aerodynamics and Aerothermodynamics Science and Technology Development*

Congressional Add: *JHTO Systems Engineering Field Activity at NSWC Crane*

Congressional Add Subtotals for Project: 065

Congressional Add Totals for all Projects

FY 2021	FY 2022
7.584	0.000
13.406	0.000
15.075	0.000
9.570	0.000
8.750	0.000
14.223	0.000
9.615	0.000
1.800	0.000
4.448	0.000
4.685	0.000
89.156	0.000
89.156	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0604165D8Z I Prompt Global Strike Capability Development	
<u>Change Summary Explanation</u> Beginning in FY 2022 Joint Hypersonics Transition Office (JHTO) activities will be administered through the newly-created Joint Hypersonic Technology Development & Transition Program Element (PE) (0603183D8Z), a budget activity three (BA-3) PE. The new PE better aligns to the intended budget activity, the JHTO mission, and congressional intent.		

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0604165D8Z / Prompt Global Strike Cap ability Development				Project (Number/Name) 065 / Joint Hypersonics			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
065: Joint Hypersonics	99.233	89.156	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY 2022 Joint Hypersonics Transition Office (JHTO) activities will be administered through the newly-created Joint Hypersonic Technology Development & Transition Program Element (PE) (0603183D8Z), a budget activity three (BA-3) PE. The new PE better aligns to the intended budget activity, the JHTO mission, and congressional intent.

In FY 2020 and FY 2021, the Joint Hypersonics Transition Office (JHTO) was funded via Congressional Add to better synchronize hypersonic technology development and workforce development. Those funds were administered through the Prompt Global Strike Capability Development Program Element (PE) - (0604165D8Z), a budget activity five (BA-5) PE. In FY 2022, the Office of the Secretary of Defense established the Joint Hypersonic Technology Development & Transition Program Element (0603183D8Z), a budget activity three (BA-3) PE, to administer JHTO funds. The new PE better aligns to the intended budget activity, the JHTO mission, and congressional intent.

A. Mission Description and Budget Item Justification

The Joint Hypersonics Transition Office (JHTO) within the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) was created to establish a university consortium for hypersonics research; support workforce development; expedite testing, evaluation, and acquisition of hypersonic technologies to meet the stated needs of the warfighter, including flight testing, ground-based-testing, and underwater launch testing; ensure that prototyping demonstration programs on hypersonic systems integrate advanced technologies to speed the maturation and deployment of future hypersonic systems; develop strategies and roadmaps for hypersonic technologies to enable the transition of such technologies to future operational capabilities for the warfighter; and, develop and implement a strategy for enhancing the current and future hypersonics workforce.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022
<i>Congressional Add:</i> University Consortium for Applied Hypersonics	7.584	0.000
<i>FY 2021 Accomplishments:</i> The JHTO established the University Consortium for Applied Hypersonics (UCAH) and solicited research projects through the Consortium to address priorities and gaps identified by the JHTO Hypersonics Science and Technology (S&T) Roadmap, focusing on workforce development, applied research and advanced technology development related to the hypersonics mission. These solicitations led to the award of 17 three-year S&T projects valued at approximately \$8.5 million dollars per year. Additionally, the Consortium		

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604165D8Z / <i>Prompt Global Strike Cap ability Development</i>	Project (Number/Name) 065 / <i>Joint Hypersonics</i>
B. Accomplishments/Planned Programs (\$ in Millions)		
hosted Spring and Fall Forums for all UCAH members, conducted six technical seminars, and briefed the UCAH governance board on the Hypersonics Science and Technology Roadmapping Process.		
FY 2022 Plans: Beginning in FY 2022 Joint Hypersonics Transition Office (JHTO) activities will be administered through the newly-created Joint Hypersonic Technology Development & Transition Program Element (PE) (0603183D8Z), a budget activity three (BA-3) PE. The new PE better aligns to the intended budget activity, the JHTO mission, and congressional intent.		
Congressional Add: HyFly2 Initial Risk Mitigation Program	13.406	0.000
FY 2021 Accomplishments: Continued the work initiated with FY 2020 funds, paving the way for a viable hypersonic cruise missile. Additional details regarding this project are sensitive and/or classified and can be provided upon request.		
FY 2022 Plans: Beginning in FY 2022 Joint Hypersonics Transition Office (JHTO) activities will be administered through the newly-created Joint Hypersonic Technology Development & Transition Program Element (PE) (0603183D8Z), a budget activity three (BA-3) PE. The new PE better aligns to the intended budget activity, the JHTO mission, and congressional intent.		
Congressional Add: Navigation, Guidance and Controls (NGC) Science and Technology Development	15.075	0.000
FY 2021 Accomplishments: Continued activities initiated with FY 2020 funds. Additional details regarding FY 2021 NGC projects are sensitive and/or classified and can be provided upon request.		
FY 2022 Plans: Beginning in FY 2022 Joint Hypersonics Transition Office (JHTO) activities will be administered through the newly-created Joint Hypersonic Technology Development & Transition Program Element (PE) (0603183D8Z), a budget activity three (BA-3) PE. The new PE better aligns to the intended budget activity, the JHTO mission, and congressional intent.		
Congressional Add: Propulsion Science and Technology Development	9.570	0.000
FY 2021 Accomplishments: Continued activities initiated with FY 2020 funds. Additional details regarding FY 2021 propulsion projects are sensitive and/or classified and can be provided upon request.		
FY 2022 Plans: Beginning in FY 2022 Joint Hypersonics Transition Office (JHTO) activities will be administered through the newly-created Joint Hypersonic Technology Development & Transition Program Element (PE)		

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604165D8Z / <i>Prompt Global Strike Capability Development</i>	Project (Number/Name) 065 / <i>Joint Hypersonics</i>
B. Accomplishments/Planned Programs (\$ in Millions)		
(0603183D8Z), a budget activity three (BA-3) PE. The new PE better aligns to the intended budget activity, the JHTO mission, and congressional intent.	FY 2021	FY 2022
Congressional Add: Systems Engineering, Design and Analysis (SEDA) Science and Technology Development FY 2021 Accomplishments: Continued activities initiated with FY 2020 funds. Additional details regarding FY 2021 SEDA projects are sensitive and/or classified and can be provided upon request. FY 2022 Plans: Beginning in FY 2022 Joint Hypersonics Transition Office (JHTO) activities will be administered through the newly-created Joint Hypersonic Technology Development & Transition Program Element (PE) (0603183D8Z), a budget activity three (BA-3) PE. The new PE better aligns to the intended budget activity, the JHTO mission, and congressional intent.	8.750	0.000
Congressional Add: Materials, Structures and Manufacturing (MSM) Science and Technology Development FY 2021 Accomplishments: Continued activities initiated with FY 2020 funds. Additional details regarding FY 2021 MSM projects are sensitive and/or classified and can be provided upon request. FY 2022 Plans: Beginning in FY 2022 Joint Hypersonics Transition Office (JHTO) activities will be administered through the newly-created Joint Hypersonic Technology Development & Transition Program Element (PE) (0603183D8Z), a budget activity three (BA-3) PE. The new PE better aligns to the intended budget activity, the JHTO mission, and congressional intent.	14.223	0.000
Congressional Add: Ordnance Science and Technology Development FY 2021 Accomplishments: Continued activities initiated with FY 2020 funds. Additional details regarding FY 2021 Ordnance projects are sensitive and/or classified and can be provided upon request. FY 2022 Plans: Beginning in FY 2022 Joint Hypersonics Transition Office (JHTO) activities will be administered through the newly-created Joint Hypersonic Technology Development & Transition Program Element (PE) (0603183D8Z), a budget activity three (BA-3) PE. The new PE better aligns to the intended budget activity, the JHTO mission, and congressional intent.	9.615	0.000
Congressional Add: Mission Planning Science and Technology Development FY 2021 Accomplishments: Continued activities initiated with FY 2020 funds. Additional details regarding FY 2021 Mission Planning projects are sensitive and/or classified and can be provided upon request. FY 2022 Plans: Beginning in FY 2022 Joint Hypersonics Transition Office (JHTO) activities will be administered through the newly-created Joint Hypersonic Technology Development & Transition Program Element (PE)	1.800	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604165D8Z / <i>Prompt Global Strike Cap ability Development</i>	Project (Number/Name) 065 / <i>Joint Hypersonics</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022
(0603183D8Z), a budget activity three (BA-3) PE. The new PE better aligns to the intended budget activity, the JHTO mission, and congressional intent.		
Congressional Add: Aerodynamics and Aerothermodynamics Science and Technology Development FY 2021 Accomplishments: Continued activities initiated with FY 2020 funds. Additional details regarding FY 2021 Aerodynamics and Aerothermodynamics projects are sensitive and/or classified and can be provided upon request. FY 2022 Plans: Beginning in FY 2022 Joint Hypersonics Transition Office (JHTO) activities will be administered through the newly-created Joint Hypersonic Technology Development & Transition Program Element (PE) (0603183D8Z), a budget activity three (BA-3) PE. The new PE better aligns to the intended budget activity, the JHTO mission, and congressional intent.	4.448	0.000
Congressional Add: JHTO Systems Engineering Field Activity at NSWC Crane FY 2021 Accomplishments: Continued to support cross-service systems engineering, technology transition, and workforce development. FY 2022 Plans: Beginning in FY 2022 Joint Hypersonics Transition Office (JHTO) activities will be administered through the newly-created Joint Hypersonic Technology Development & Transition Program Element (PE) (0603183D8Z), a budget activity three (BA-3) PE. The new PE better aligns to the intended budget activity, the JHTO mission, and congressional intent.	4.685	0.000
Congressional Adds Subtotals	89.156	0.000

C. Other Program Funding Summary (\$ in Millions) N/A
Remarks
D. Acquisition Strategy NA

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0604165D8Z / Prompt Global Strike Capability Development					Project (Number/Name) 065 / Joint Hypersonics				
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
University Consortium for Applied Hypersonics	C/FFP	Texas A&M Engineering Experiment Station : College Station, TX	10.683	7.584		-		-		-		-	Continuing	Continuing	-
University Science and Technology Research Grants	Grant	Multiple : Multiple	4.248	0.000		-		-		-		-	Continuing	Continuing	-
HyFly2 Initial Risk Mitigation Program	MIPR	Boeing Defense and Aerospace : St. Charles, MO	34.621	13.406		-		-		-		-	Continuing	Continuing	-
Navigation, Guidance and Controls Science and Technology Development	MIPR	Sandia Natl. Labs; Johns Hopkins University Applied Research Lab; MITRE; DARPA : Albuquerque, NM; Laurel, MD; McClean/Arlington, VA	13.371	15.075		-		-		-		-	Continuing	Continuing	-
Propulsion Science and Technology Development	MIPR	Air Force Research Labs; DARPA; MDA; Lockheed Martin; Aerojet Rocketdyne : Edwards, CA; Dayton, OH; Baytown, TX; Tucson, AZ	11.523	9.570		-		-		-		-	Continuing	Continuing	-
Systems Engineering, Design and Analysis Science and Technology Development	MIPR	U.S. Army Aviation & Missile Center : Huntsville, AL	5.150	8.750		-		-		-		-	Continuing	Continuing	-
Materials, Structures and Manufacturing Science and Technology Development	MIPR	NSWC Carderock; NASA; Air Force Research Labs : Bethesda, MD;	2.500	14.223		-		-		-		-	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0604165D8Z I Prompt Global Strike Cap ability Development				Project (Number/Name) 065 I Joint Hypersonics					
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Hampton, VA; Dayton, OH													
Ordnance Science and Technology Development	MIPR	Air Force Research Labs; NSWC Carderock; NSWC Indian Head : Eglin AFB, FL; Bethesda, MD, Indian Head, MD	4.050	9.615		-		-		-		-	Continuing	Continuing	-
Mission Planning Science and Technology Development	MIPR	Sandia National Labs; Army Aviation & Missile Center; Johns Hopkins University Applied Research Lab; Air Force Research Labs : Albuquerque, NM; Huntsville, AL; Laurel, MD	3.750	1.800		-		-		-		-	Continuing	Continuing	-
Aerodynamics and Aerothermodynamics Science and Technology Development	MIPR	MDA : Huntsville, AL	2.500	4.448		-		-		-		-	Continuing	Continuing	-
JHTO Systems Engineering Field Activity at NSWC Crane	MIPR	Naval Survice Warfare Center Crane Division : Crane, IN	4.685	4.685		-		-		-		-	Continuing	Continuing	-
JHTO Manpower, Support and Administration	Option/ Various	Frontier Technology, Inc.; Johns Hopkins University Applied Physics Laboratory : Yellow Springs, OH; Laurel, MD;	2.152	-		-		-		-		-	Continuing	Continuing	-
Subtotal			99.233	89.156		-		-		-		-	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense											Date: April 2022			
Appropriation/Budget Activity 0400 / 5				R-1 Program Element (Number/Name) PE 0604165D8Z / Prompt Global Strike Cap ability Development				Project (Number/Name) 065 / Joint Hypersonics						
		Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		99.233	89.156		-		-		-		-	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense										Date: April 2022	
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0604165D8Z / Prompt Global Strike Cap ability Development					Project (Number/Name) 065 / Joint Hypersonics	

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
University Consortium for Applied Hypersonics																												
Award Consortium Contract and Begin Consortium Activities																												
University Science and Technology Research Grants																												
Eight University Grants Research Conducted/ Completed, Technical Reports Received by JHTO.																												
Hy Fly2 Initial Risk Mitigation Program																												
Inlet Risk Reduction, Dual Mod RamJet/ Scramjet Risk Reduction, Final Project Review																												
Navigation, Guidance and Controls Science and Technology Development																												
Project Funding, Initiation, Review and Completion																												
Propulsion Science and Technology Development																												
Project Funding, Initiation, Review and Completion																												
Systems Engineering, Design and Analysis Science and Technology Development																												
Project Funding, Initiation, Review and Completion																												
Materials, Structure and Manufacturing Science and Technology Development																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense																		Date: April 2022																			
Appropriation/Budget Activity 0400 / 5										R-1 Program Element (Number/Name) PE 0604165D8Z / Prompt Global Strike Cap ability Development										Project (Number/Name) 065 / Joint Hypersonics																	
										FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
										1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Project Funding, Initiation, Review and Completion																																					
Ordnance Science and Technology Development																																					
Project Funding, Initiation, Review and Completion																																					
Mission Planning Science and Technology Development																																					
Project Funding, Initiation, Review and Completion																																					
Aerodynamics and Aerothermodynamics Science and Technology Development																																					
Project Funding, Initiation, Review and Completion																																					
JHTO Systems Engineering Field Activity at NSWC Crane																																					
Systems Engineering, Integration and Workforce Development																																					
JHTO Manning, Administration, and Contract Support																																					
Establish Manpower, Develop Workplan, Initiate and Continue JHTO Operations																																					
										FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
										1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
University Consortium for Applied Hypersonics																																					

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense																Date: April 2022												
Appropriation/Budget Activity 0400 / 5										R-1 Program Element (Number/Name) PE 0604165D8Z / Prompt Global Strike Cap ability Development								Project (Number/Name) 065 / Joint Hypersonics										
	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Award Consortium Contract and Begin Consortium Activities																												
University Science and Technology Research Grants																												
Eight University Grants Research Conducted/ Completed, Technical Reports Received by JHTO.																												
Hy Fly2 Initial Risk Mitigation Program																												
Inlet Risk Reduction, Dual Mod RamJet/ Scramjet Risk Reduction, Final Project Review																												
Navigation, Guidance and Controls Science and Technology Development																												
Project Funding, Initiation, Review and Completion																												
Propulsion Science and Technology Development																												
Project Funding, Initiation, Review and Completion																												
Systems Engineering, Design and Analysis Science and Technology Development																												
Project Funding, Initiation, Review and Completion																												
Materials, Structure and Manufacturing Science and Technology Development																												
Project Funding, Initiation, Review and Completion																												
Ordnance Science and Technology Development																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense																Date: April 2022												
Appropriation/Budget Activity 0400 / 5										R-1 Program Element (Number/Name) PE 0604165D8Z / Prompt Global Strike Capability Development								Project (Number/Name) 065 / Joint Hypersonics										
	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Project Funding, Initiation, Review and Completion																												
Mission Planning Science and Technology Development																												
Project Funding, Initiation, Review and Completion																												
Aerodynamics and Aerothermodynamics Science and Technology Development																												
Project Funding, Initiation, Review and Completion																												
JHTO Systems Engineering Field Activity at NSWC Crane																												
Systems Engineering, Integration and Workforce Development																												
JHTO Manning, Administration, and Contract Support																												
Establish Manpower, Develop Workplan, Initiate and Continue JHTO Operations																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense

Date: April 2022

Appropriation/Budget Activity

0400 / 5

R-1 Program Element (Number/Name)

PE 0604165D8Z / Prompt Global Strike Cap
ability Development

Project (Number/Name)

065 / Joint Hypersonics

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
University Consortium for Applied Hypersonics				
Award Consortium Contract and Begin Consortium Activities	1	2021	4	2025
University Science and Technology Research Grants				
Eight University Grants Research Conducted/Completed, Technical Reports Received by JHTO.	4	2020	4	2021
Hy Fly2 Initial Risk Mitigation Program				
Inlet Risk Reduction, Dual Mod RamJet/Scramjet Risk Reduction, Final Project Review	4	2020	4	2023
Navigation, Guidance and Controls Science and Technology Development				
Project Funding, Initiation, Review and Completion	4	2020	3	2023
Propulsion Science and Technology Development				
Project Funding, Initiation, Review and Completion	4	2020	4	2022
Systems Engineering, Design and Analysis Science and Technology Development				
Project Funding, Initiation, Review and Completion	4	2020	3	2023
Materials, Structure and Manufacturing Science and Technology Development				
Project Funding, Initiation, Review and Completion	4	2020	4	2022
Ordnance Science and Technology Development				
Project Funding, Initiation, Review and Completion	4	2020	4	2023
Mission Planning Science and Technology Development				
Project Funding, Initiation, Review and Completion	4	2020	4	2021
Aerodynamics and Aerothermodynamics Science and Technology Development				
Project Funding, Initiation, Review and Completion	4	2020	4	2021
JHTO Systems Engineering Field Activity at NSW Crane				

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense				Date: April 2022	
Appropriation/Budget Activity 0400 / 5		R-1 Program Element (Number/Name) PE 0604165D8Z / Prompt Global Strike Capability Development		Project (Number/Name) 065 / Joint Hypersonics	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
Systems Engineering, Integration and Workforce Development		4	2020	4	2023
JHTO Manning, Administration, and Contract Support					
Establish Manpower, Develop Workplan, Initiate and Continue JHTO Operations		2	2020	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: Research, Development, Test & Evaluation, Defense-Wide I BA 5: System Development & Demonstration (SDD)					PE 0604771D8Z I Joint Tactical Information Distribution System (JTIDS)							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	223.607	49.458	21.292	9.120	-	9.120	9.025	9.188	9.170	9.166	Continuing	Continuing
771: Link-16 Tactical Data Link (TDL) Transformation	153.972	17.658	21.292	9.120	-	9.120	9.025	9.188	9.170	9.166	Continuing	Continuing
105: Cyber Capability & Platform Resilience	56.864	20.037	-	-	-	-	-	-	-	-	-	-
028: Cybersecurity: Cybersecurity Maturity Model Certification (CMMC) and Pathfinders	12.771	11.763	-	-	-	-	-	-	-	-	-	-
Note												
New Start (Y/N): No												
A. Mission Description and Budget Item Justification												
This program supports the Department's initiatives to Defend the Homeland, Provide Nuclear Deterrence, and Build Sustainable and Long-Term Advantage.												
This program provides in-depth technical, engineering, integration support, and system of system analysis for space, missile defense, cyber, C4ISR, NC3, and nuclear delivery system modernization program portfolio management.												
- Command, Control, Communications, Computers and Intelligence, Surveillance, and Reconnaissance: Develop and maintain a roadmap to improve data link interoperability, data link waveform standards, and global enterprise capabilities, enabling resilient, survivable, federated networks.												
- Nuclear Forces (Nuclear Command, Control, and Communications (NC3)): Execute NC3 Enterprise Capability Portfolio Management on behalf of the Under Secretary of Defense for Acquisition and Sustainment (USD(A&S)).												

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604771D8Z I <i>Joint Tactical Information Distribution System (JTIDS)</i>
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B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	51.284	9.345	0.000	-	0.000
Current President's Budget	49.458	21.292	9.120	-	9.120
Total Adjustments	-1.826	11.947	9.120	-	9.120
• Congressional General Reductions	-	-0.053			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	12.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.826	-			
• Adjustments to Budget Year	-	-	9.120	-	9.120

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0604771D8Z / Joint Tactical Information Distribution System (JTIDS)				Project (Number/Name) 771 / Link-16 Tactical Data Link (TDL) Transformation			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
771: Link-16 Tactical Data Link (TDL) Transformation	153.972	17.658	21.292	9.120	-	9.120	9.025	9.188	9.170	9.166	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Provide in-depth technical, engineering, integration support, and system of system analysis for space, missile defense, cyber, C4ISR, NC3, and nuclear delivery system modernization program portfolio management.

- Command, Control, Communications, Computers and Intelligence, Surveillance, and Reconnaissance: Develop and maintain a roadmap to improve data link interoperability, data link waveform standards, and global enterprise capabilities, enabling resilient, survivable federated networks.
- Nuclear Forces (Nuclear Command, Control, and Communications (NC3)): Execute NC3 Enterprise Capability Portfolio Management on behalf of the Under Secretary of Defense for Acquisition & Sustainment (USD(A&S)).

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Common Joint Tactical Information Initiatives	17.658	21.292	9.120
Description: FY 2021 Accomplishments: C4ISR: <ul style="list-style-type: none"> - As OUSD(A&S) Principal Staff Assistant for Common Data Link (CDL), assessed CDL Modernization Policy compliance and conducted system performance analysis supporting development of the Joint Staff DJ6-signed CDL Joint Vision and Roadmap. - Developed and oversaw execution of Department-wide acquisition strategy for Airborne Intelligence, Surveillance, and Reconnaissance (AISR) systems that resulted in increased AISR data sharing between unified combatant commands and coalition partners. - Advised multi-agency technical feasibility study and operational impact assessment for retuning and replacing legacy air route surveillance radars to support auction of Federal spectrum for non-Federal use as required by the Spectrum Pipeline Act of 2015. - Developed Department-wide strategy to accelerate development and fielding of 5G-compatible weapon systems and revised acquisition policy to consider 5G principles. - As co-chair of the Command, Control, and Communication Leadership Board (C3LB) governance council, performed oversight and cross-Service coordination of Tactical Data Link (TDL) modernization acquisitions to improve DoD system interoperability. - Tracked and assessed testing of Link 16 capability improvements to multiple military platforms. Supported JS J6 efforts to prioritize fielding of tactical radio replacements to address cryptographic modernization issues. - Performed portfolio management of Joint Command and Control (C2) acquisitions. Identified multi-Service programmatic disconnects for air operations planning capabilities; engaged with joint community to develop resolution courses of action. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604771D8Z / <i>Joint Tactical Information Distribution System (JTIDS)</i>	Project (Number/Name) 771 / <i>Link-16 Tactical Data Link (TDL) Transformation</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> - Co-led study with DoD CIO to identify current Joint C2 programs which must endure until integrated into, or replaced by a future a Joint All-Domain C2 (JADC2) capability. - Collaborated with DoD and Intelligence Community acquisitions and oversight staff to identify agile development lessons learned, best practices, and best-of-breed tools and metrics to improve performance forecasting and insight for stakeholders, oversight, and project managers. - Supported OUSD(A&S) International Cooperation activities, including the US-France Communications Interoperability Working Group. Coordinated multiple Yockey waivers, DoD Advocacy Requests, and international policies. <p>NC3:</p> <ul style="list-style-type: none"> - Conducted NC3 enterprise assessments in the critical areas of Presidential Voice Conferencing, NC3 Early Warning, and NC3 High Frequency modernization. Implementing key findings aimed at producing a more resilient NC3 capable system. - Supported the NC3 Capability Portfolio Manager (CPM) with analysis presented to senior leadership bodies (NC3 Enterprise Review, Deputy's Management Action Group, SECDEF Nuclear Transition Review, etc.) and recommend investment and policy alternatives. Draft NC3 program protection planning policy, NC3 cybersecurity systems engineering standards, modernization assessments, sustainment assessments. - Conducted NC3 mission thread analysis on B-52H systems to identify schedule risk and integration challenges relating to the Force Direction mission essential function of the bomber force in executing OPLANS. <p>Strategic Deterrence:</p> <ul style="list-style-type: none"> - Supported the recapitalization of the nation's nuclear deterrent, drove risk reduction in nuclear delivery system modernization programs, enhanced sustainment of existing legacy nuclear capabilities, and began developing the Nuclear Posture Review. <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> - Common Data Link (CDL) Capability Portfolio Management (CPM): Continue to execute USD(A&S) roles as Principal Staff Assistant (PSA) for CDL. Work with DoD Components to maintain currency of the CDL technology roadmap and terminal database to prioritize commonality, open architecture, and non-proprietary systems for current and emerging platform, sensor, and weapons ISR data transport requirements. Conduct annual CDL enterprise modernization analysis and review Service PPBE submissions to assess enterprise migration off To Be Sunset (CDL-TBD) waveforms by 2023. - Intelligence, Surveillance, and Reconnaissance Data Transport and Task, Process, Exploit and Disseminate Intelligence Information: Technical Support as the co-lead with USD(I) to modernize and migrate the DoD Distributed Common Ground family of systems to an enterprise capability through four lines of effort 1) migrating long-term to a cross-component DCGS enterprise cloud solution; 2) utilizing the DI2E framework to establish a common DCGS data fabric; 3) advancing cyber security/accreditation reciprocity; and 4) developing a shared concept for how we will jointly operate to meet the objectives of the NDS. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604771D8Z / <i>Joint Tactical Information Distribution System (JTIDS)</i>	Project (Number/Name) 771 / <i>Link-16 Tactical Data Link (TDL) Transformation</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>- Command, Control, and Communications Leadership Board (C3LB): As a Tri-Chair, provide strategic planning, prioritization, policy execution, resource review, and effective capability management and oversight of DoD C3 and Electromagnetic Spectrum (EMS) initiatives. Accelerate and synchronize fielding of modernized networking solutions across the joint force with the objective of establishing priorities and strategies that enable implementation across the DoD C3 and EMS enterprises. As part of C3LB governance structure, engage subordinate Senior Steering Groups on relevant matters: SATCOM Systems Engineering Group (SSEG), Tactical Communications Senior Steering Group (TCSSG), Electromagnetic Spectrum Senior Steering Group (EMS SSG), and Public Safety Communications Senior Steering Group (PSC SSG).</p> <p>- Joint Tactical Networking Center (JTNC): Provide technical and programmatic analysis to support DoD's rapid identification, characterization, procurement, fielding, and sustainment of modular, innovative tactical communications products that ensure secure, interoperable, and resilient C4ISR capabilities. Develop, with D/CIO and J6, robust waveform repository providing programmatic technical guidance to the JTNC. Continue to enhance Link-16 and other waveforms by active engagement and leadership at the Joint Datalink Acquisition Working Group". Provide product support in CDL and Link-16 Crypto Modernization working with Service EAs and NSA. JTNC will continue to execute core priorities including: support for JADC2; chair of Communication Technology and Waveform Working Group (CTWWG) under the C3LB/TCSSG governance structure; Lead Service support with respect to key waveforms to comply with Deputy Secretary of Defense tasking; facilitating government and industry stakeholder interaction with Joint Communications Marketplace; Waveform Capability Characterization; HF Modernization support; Modular Radio Architecture efforts; and maintaining the DoD Information Repository operating environment.</p> <p>- Integrated Electromagnetic Spectrum Operations (EMSO): Implement integrated transport, radio communications, and Electronic Warfare(EW)/EMSO capability development to ensure NDS objectives for integrated Spectrum operations and capabilities are met. Provide acquisition support to the Department's 5G strategy</p> <p>- Spectrum: Provide executive guidance, technical expertise, and acquisition support for the Spectrum Efficient National Air Surveillance Radar (SENSR) system. In FY 2022 SENSR milestones will include work specific to risk reduction efforts and the development and refinement of Implementation and Transition Plans. Integrate results from Institute for Defense Analyses (IDA) radar supply chain study into spectrum relocation efforts, updating plans as necessary. Continue work with the NDIA to engage industry on the development of spectrum sharing capability, regulations, and policies. Track and monitor spectrum conflict status between DoD, industry, and spectrum controlling bodies while promoting optimal use of spectrum for 5G through NDIA working group as well as through the DoD 5G test beds. Facilitate the transition for 5G solutions, that are part of DoD 5G Strategy, to the services, to be developed and tested through the DoD 5G test beds. Conducts interaction with industry and countries to support mutual interests in 5G innovation and enhancing security measures to ensure availability, security, and reliability of the 5G supply chain. OUSD(A&S) seeks opportunities to inject 5G technologies into acquisition programs and takes advantage of smart warehousing and other 5G-enabled capabilities in DoD's sustainment systems.</p> <p>- Tactical Datalink: Implement the TDL Roadmap using the JTWG as a coordination group to transition to TDL LPD/LPI waveforms as required by the Deputy Secretary of Defense (DEPSECDEF) Memorandum "Enhancing DoD's Joint Tactical Networks and Datalink Modernization." Synchronize service acquisition strategies to gain synergistic efficiencies and maintain</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604771D8Z / <i>Joint Tactical Information Distribution System (JTIDS)</i>	Project (Number/Name) 771 / <i>Link-16 Tactical Data Link (TDL) Transformation</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>interoperability between the services, allies, and partner nations. Continue to track and assess capability improvements in Multi-function Information Distribution System (MIDS) and F-35 Communications, Navigation & Identification (CNI) terminals, emerging 6th Gen aircraft and Weapons Data Link (WDL) concepts. Continue support of international efforts including US France CIWG and other efforts to support NDS Strengthen Alliances and Attract New Partners.</p> <ul style="list-style-type: none"> - Execute the Joint C2 Acquisition Capability Portfolio Management strategy in support of reprogramming decisions within year of execution and future years program budget development. Evolve the Joint C2 Acquisition Portfolio to include and provide acquisition integration and synchronization for materiel solutions sponsored through Joint All Domain Command and Control (JADC2) efforts. - Provide technical expertise for Joint All Domain Command and Control (JADC2) Operations Planning Teams (OPT), provide coordination and AO support for reviews of JADC2 Reference Architecture, Data Integration, Budget and Campaign Plan products as they are developed to support critical cross-functional team timelines and deliverables. - Support AISR DT ITF initiatives to provide material and non-materiel solutions that meet Combatant Commander AISR DT requirements by developing/improving the capabilities of AISR platforms to enable/expand the download and/or relay of sensor information through DoD gateways to U.S. warfighters and U.S. allies in each of the geographic Combatant Commanders' theaters in support of humanitarian relief and contingency operations. - Engage in C4/Cyber and Battlespace Awareness FCBs to ensure C4ISR Directorate equities and interests are adequately addressed and to help inform the management of systems within the C4ISR portfolio. - International: Continue support to the A&S International Cooperation on multiple efforts to support NDS Strengthen Alliances and Attract New Partners. Provide support to the US FR CIWG, the NGCC with the UK, and support for the multiple other minor efforts such as Yockey waivers, review of policy issues, and support for meetings. - Execute agile development practices within DoD and Intelligence Community software driven acquisitions, including program health check and program future performance forecasting methodologies and tools and lessons learned/best practices capabilities to provide insights and recommendations to project managers and stakeholders towards improving program execution performance and inform senior steering committee meetings. - Strategic Deterrence: Support the recapitalizing the nation's nuclear deterrent, driving risk reduction in nuclear modernization programs, enhancing sustainment of existing legacy nuclear capabilities, and implementing the Nuclear Posture Review. - Support DEPSECDEF Integrated Acquisition Portfolio Review implementation for NC3 to allow systems based processes that enable visibility of risks, dependencies, and opportunities at an enterprise level to optimize strategic insight, synchronization, coordination, and decision-making. - Support the NC3 Capability Portfolio Manager (CPM) with analysis presented to senior leadership bodies (NC3 Enterprise Review, Deputy's Management Action Group, the Secretary of Defense (SECDEF) Nuclear Transition Review, etc.) and recommend investment and policy alternatives. Update NC3 program protection planning policy, NC3 cybersecurity systems engineering standards, modernization assessments, and comprehensive NC3 portfolio assessments. 			
		FY 2023	

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604771D8Z / <i>Joint Tactical Information Distribution System (JTIDS)</i>	Project (Number/Name) 771 / <i>Link-16 Tactical Data Link (TDL) Transformation</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>- Conduct NC3 mission thread analysis on Presidential Voice Conferencing systems to identify schedule risk and integration challenges relating to the Decision Making mission essential function supporting POTUS and senior advisor decision process.</p> <p>FY 2023 Plans:</p> <p>C4ISR:</p> <ul style="list-style-type: none"> - Perform role as OUSD(A&S) Principal Staff Assistant (PSA) for Common Data Link (CDL) by maintaining CDL technology roadmap and terminal database, conducting annual enterprise CDL analysis, and reviewing Service budget submissions for policy compliance. - Assist Services and combatant commands develop acquisition strategies to modernize their Distributed Common Ground System (DCGS) deployments in accordance with OUSD(I&S) guidelines and NDS information sharing goals and objectives. - As a Co-Chair for the Command, Control, and Communications Leadership Board (C3LB), conduct strategic planning, prioritization, policy execution, resource review, and oversight of DoD C3 and Electromagnetic Spectrum (EMS) initiatives. - Perform governance management and oversight of the Joint Tactical Networking Center (JTNC) which support DoD's goal of rapid identification, characterization, procurement, fielding, and sustainment of modular, innovative tactical communications systems. - Provide acquisition support and expertise to integrated electromagnetic spectrum (EMS) operations to ensure capabilities are met through integrated electronic transport that remain unimpeded in contested and congested EMS environments.- Provide executive guidance, technical expertise, and acquisition support for the Spectrum Efficient National Air Surveillance Radar system to ensure a secure National Airspace System capable of supporting protection and defense of the homeland. - In support of the National Defense Strategy line of effort to build a more lethal force, develop accelerated 5G acquisition strategies and requirements that allow DoD to leverage and deploy 5G technologies at the speed of commercial industry. - Implement the Tactical Data Link (TDL) Capability Roadmap by synchronizing Department acquisition strategies to field next generation waveforms, gain efficiencies, and maintain interoperability between the Services, allies, and partner nations. - Promote Joint C2 program integration and synchronization across Components, Services, and Agencies, lead resolution of portfolio disconnects, and provide recommendations to OUSD(A&S) leadership regarding Joint C2 reprogramming. - Provide acquisition expertise to advance Joint All Domain Command and Control (JADC2) Cross Functional Team (CFT) sponsored efforts to include document development, reviews, and major studies for acquisition and material development efforts. - Leverage artificial intelligence and machine learning to increase Airborne Intelligence, Surveillance, and Reconnaissance (AISR) data transport system capabilities and implement a network maintenance concept ensuring end-to-end operational availability. - Provide acquisition expertise to the Command, Control, Communications, and Computers (C4)/Cyber and Battlespace Awareness Functional Capabilities Boards (FCB) and perform acquisition portfolio management of Joint Requirements Oversight Council (JROC) approved C4ISR systems. - Continue support to OUSD(A&S) International Cooperation activities in line with the National Defense Strategy to strengthen alliances and attract new partners. Continue coordination for Yockey waivers, DoD Advocacy Requests, and policy issues. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 5		R-1 Program Element (Number/Name) PE 0604771D8Z / <i>Joint Tactical Information Distribution System (JTIDS)</i>		Project (Number/Name) 771 / <i>Link-16 Tactical Data Link (TDL) Transformation</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>- Continue collaboration with DoD and Intelligence Community acquisitions and oversight staff to refine agile development lessons learned, best practices, and best-of-breed tools and metrics into acquisition policy and guidance and implement across all DoD agile development programs.</p> <p>NC3:</p> <ul style="list-style-type: none"> - Work with the Under Secretary of Defense Research and Engineering to develop Science and Technology Strategic Plans to develop next generation NC3 capabilities and to ensure a viable path exists to transition technology to new or existing acquisition programs. - Support the NC3 Capability Portfolio Manager (CPM) with analysis presented to senior leadership bodies (NC3 Enterprise Review, Deputy's Management Action Group, SECDEF Nuclear Transition Review, etc.) and recommend investment and policy alternatives. Update NC3 program protection planning policy, NC3 cybersecurity systems engineering standards, modernization assessments, and comprehensive NC3 portfolio assessments. - Conduct NC3 mission thread analysis on land and space based detection systems to identify schedule risk and capability gaps relating to the Situational Awareness mission essential function that allows prompt early warning to senior decision makers under nuclear scenarios. <p>Strategic Deterrence:</p> <ul style="list-style-type: none"> - Support the recapitalizing the nation's nuclear deterrent, driving risk reduction in nuclear modernization programs, enhancing sustainment of existing legacy nuclear capabilities, and implementing the Nuclear Posture Review. <p>SMD:</p> <ul style="list-style-type: none"> - Provide assessment of the technical challenges to developing/implementing protected tactical satellite communications (SATCOM) systems including identification of future limitations anticipated for operators and the interoperability between systems located at different orbits. - Support narrowband SATCOM Analysis of Alternatives (AoA) study and follow-on activities in order to inform leadership recommendations and determine future of narrowband SATCOM capabilities. - Support assessment of wideband SATCOM protected tactical topology for programs in development as well as being planned. Activities will include program assessments and enterprise analysis to inform portfolio resource investment decisions. - Engage in Force Protection and Battlespace Awareness Functional Capabilities Board (FCB) Working Groups, FCBs, and Joint Capabilities Boards to ensure Space and Missile Defense Directorate equities and interests are adequately addressed, with specific focus on the synergies/integration between the space and ground segments and associated command and control (C2); tracking, telemetry, and commanding (TT&C); SATCOM, and other key data links. <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i></p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604771D8Z / <i>Joint Tactical Information Distribution System (JTIDS)</i>	Project (Number/Name) 771 / <i>Link-16 Tactical Data Link (TDL) Transformation</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
The decrease from FY 2022 to FY 2023 is due to this program element receiving a \$12M congressional add in FY 2022.			
Accomplishments/Planned Programs Subtotals		17.658	21.292
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy Utilize existing fixed-price and cost-plus contracts (where appropriate) to continue providing in-depth technical, engineering, integration support, and system of system analysis for space, missile defense, and C4ISR.			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0604771D8Z / <i>Joint Tactical Information Distribution System (JTIDS)</i>						Project (Number/Name) 771 / <i>Link-16 Tactical Data Link (TDL) Transformation</i>			
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Link-16 Tactical Data Link (TDL) Transformation	C/TBD	OUSD A&S DASD I&IPM : Pentagon	153.972	17.658	Jan 2021	21.292	Jan 2021	9.120	Jan 2021	-		9.120	Continuing	Continuing	Continuing
Subtotal			153.972	17.658		21.292		9.120		-		9.120	Continuing	Continuing	N/A
Remarks NA															
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			153.972	17.658		21.292		9.120		-		9.120	Continuing	Continuing	N/A
Remarks Resources will be used to provide technical, systems engineering and acquisition management oversight of programs, projects and activities to maximize the Department's return on investment in information technology resources and to affect a comprehensive approach for assessing and procuring critical information systems from initial design, through development to capability delivery in support of improved weapons systems performance and military operations.															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604771D8Z / <i>Joint Tactical Information Distribution System (JTIDS)</i>	Project (Number/Name) 771 / <i>Link-16 Tactical Data Link (TDL) Transformation</i>

	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027													
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Link-16 Comm Tactical Data Link (TDL) Transformation																				
Contract Awards																				

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604771D8Z / <i>Joint Tactical Information Distribution System (JTIDS)</i>	Project (Number/Name) 771 / <i>Link-16 Tactical Data Link (TDL) Transformation</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Link-16 Comm Tactical Data Link (TDL) Transformation</i>				
Contract Awards	1	2021	3	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0604771D8Z / Joint Tactical Information Distribution System (JTIDS)				Project (Number/Name) 105 / Cyber Capability & Platform Resilience			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
105: Cyber Capability & Platform Resilience	56.864	20.037	-	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
Provides resources for developmental acquisition support and portfolio management in support of three primary Goals in support of the Department of Defense (DoD) Cyber Strategy												
1) Trained and Equipped Cyber Mission Force												
2) Cyber Hardened Weapon Systems and Critical Infrastructure												
3) Enhanced Defense Industrial Base (DIB) Cyber Security												
The Office of the Undersecretary of Defense for Acquisition and Sustainment (OUSD(A&S)) conducts mission engineering for cyberspace operations to inform and support the development of Joint Cyber capabilities as the Department conceives, develops, and rapidly fields cyber capabilities for Cyberspace Operations. The newly established OUSD(A&S) Chief Information Security Office (CISO) was created to improve planning, coordination, synchronization, and integration of cyber activities and increase the DoD wide emphasis on reducing the cyber risk to critical DoD missions and enhancing DIB Cyber Security.												
Funds provide technical, systems engineering, trend analysis, and portfolio management of programs, projects, and activities developing cyber capabilities to maximize the Department's return on investment of cyberspace resources and effect a comprehensive approach for assessing, procuring, and sustaining critical cyber capabilities and cyber resilient systems and platforms from initial design, through development to capability delivery in support of weapons systems performance and military operations.												
Additionally, these funds will provide systems analyses, portfolio management, and executive support of Senior Cyber Leadership forums, enterprise wide systems engineering and operational impact analyses related to Cyber capabilities, enhancing cyber resilience within systems and platforms, and enhancing the cybersecurity of the DIB.												
Resources will also be used to provide expertise required for exercising technical direction over design, performance, cost parameters, and determining and mitigating cyber risks of key systems and their dependencies. The goal of this funding is to assure capability advantage, reduce time to the field, evaluate projects and concepts, minimize cyber related performance and operational risk of developing and fielding complex systems, ensure program dependencies are documented and included in acquisition decisions, and address cyber security requirements, gaps, and required technical solutions.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: Cyber Capability and Platform Resilience									20.037	0.000	-	

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 5		R-1 Program Element (Number/Name) PE 0604771D8Z <i>I Joint Tactical Information Distribution System (JTIDS)</i>		Project (Number/Name) 105 <i>I Cyber Capability & Platform Resilience</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>Description: FY 2021 Accomplishments:</p> <ul style="list-style-type: none"> - Published the Cyber Invictus After Action Report which provided an assessment for U.S. Cyber Command (USCYBERCOM) on capability and capacity of the Cyber Protection Teams (CPT) during a global conflict. The Cyber Invictus assessment informed CDR USCYBERCOM's planning and decision making on the command relationships and organization of the Cyber Mission Force (CMF). - Completed the Mission Resilience I (MR I) wargame co-sponsored by U.S. European Command (USEUCOM) and U.S. Transportation Command (USTRANSCOM) focused on global logistics in support of a war plan. This included seven milestone events to inform the wargame's red campaign plan, blue force defense plans, risk to mission measurements, and two table top exercises (TTX) that included U.S. transportation agencies and DOD's commercial partners, as well as, key stakeholders throughout the DOD. - Transitioned the Cyber Resilience IV (CR IV) wargame recommendations to the Mission Focused Cyber Hardening Team (MFCHT), working with U.S. Indo-Pacific Command (USINDOPACOM), U.S. Space Command (USSPACECOM), and other key stakeholders. - Participated in the Joint All Domain Command and Control (JADC2) operational planning team (OPT) for the Joint Concept for Contested Logistics (JCCL) led by Joint Staff J4. - Completed the three (3) following DCRA's: 1) quick reaction DCRA at a USAF location in support of the SCP Pilots, 2) US Army/ USTRANSCOM critical location, 3)USAF/USTRANSCOM critical system - Worked with CCMD and Service Mission owners developing recommended mitigations for risk identified during mission based cyber risk assessments. - Approved and published the DoD Instruction 5000.90. - Completed the Strategic Cybersecurity Program (SCP) pilot study of Ground Based Strategic Deterrent (GBSD) program and 9 case studies developed documenting acquisition cybersecurity best practices. - Completed the SCP pilot study of cybersecurity of DCI at USAF Site 1 and series of targeted recommendations delivered to USAF. - 20 of 20 priority recommendations from USEUCOM Ballistic Missile Defense (BMD) Mission Resilience Game (MRG) were successfully implemented and relevant cybersecurity vulnerabilities mitigated. - Mitigation Prioritization Framework (MPF) developed for incorporation into CRMT to enable prioritization among many cybersecurity vulnerabilities for mitigation implementation and resourcing, and testing/validation strategy developed. - Re-established the Weapons Systems Cybersecurity Council of Colonels including representatives from USA, USAF, USMC, USN, PCA, DoD CIO, JS J6, OUSD(Policy), etc. - Provided acquisition objectives for Joint Cyber Warfighting Architecture (JCWA) and 2018 DoD Cyber Strategy Line of Effort (LOE 4) POA&M 					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604771D8Z / <i>Joint Tactical Information Distribution System (JTIDS)</i>	Project (Number/Name) 105 / <i>Cyber Capability & Platform Resilience</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> - Developed JCWA Roadmap and Backlog Context diagram explaining the many backlog layers associated with operational, portfolio, and product backlog. - Conducted a JCWA Acquisition Management Arrangement (AMA) Assessment to determine initial requirements for an overarching JCWA acquisition organization. Surveyed OSD, USCYBERCOM, Service Cyber Components (SCCs), Service Acquisition Executive (SAE) organizations, and JCWA Component Program Management Offices (PMO). Recommended fundamental organization functions and relationships to improve JCWA system engineering and interfaces. - Assessed Intelligence Support to Acquisition (ISA) structure, process, and current weaknesses that result in acquisition offices delivering compromised systems/components into operations <p><i>FY 2022 Plans:</i> Funding realigned to 0606771D8Z.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> NA</p>			
Accomplishments/Planned Programs Subtotals		20.037	0.000
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
Utilize existing fixed-price and cost-plus contracts (where appropriate) to continue developmental acquisition support and portfolio management in support of three primary Goals in support of the Department of Defense (DoD) Cyber Strategy			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0604771D8Z / <i>Joint Tactical Information Distribution System (JTIDS)</i>						Project (Number/Name) 105 / <i>Cyber Capability & Platform Resilience</i>			
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contract awards	C/CPFF	OUSD OCISO (A) : Pentagon/Mark Center	56.864	20.037		-		-		-		-	Continuing	Continuing	-
Subtotal			56.864	20.037		-		-		-		-	Continuing	Continuing	N/A
Remarks NA															
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			56.864	20.037		-		-		-		-	Continuing	Continuing	N/A
Remarks NA															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604771D8Z / <i>Joint Tactical Information Distribution System (JTIDS)</i>	Project (Number/Name) 105 / <i>Cyber Capability & Platform Resilience</i>	

FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Cyber Capability and Platform Resilience																												
Contract Awards																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604771D8Z / Joint Tactical Information Distribution System (JTIDS)	Project (Number/Name) 105 / Cyber Capability & Platform Resilience	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Cyber Capability and Platform Resilience				
Contract Awards	1	2021	2	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0604771D8Z / Joint Tactical Information Distribution System (JTIDS)				Project (Number/Name) 028 / Cybersecurity: Cybersecurity Maturity Model Certification (CMMC) and Pathfinders			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
028: Cybersecurity: Cybersecurity Maturity Model Certification (CMMC) and Pathfinders	12.771	11.763	-	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Implement and maintain the Cybersecurity Maturity Model Certification (CMMC) framework that incorporates multiple cybersecurity standards and references into a unified standard that encompasses both the progression of cybersecurity practices as well as the institutionalization of processes to secure Controlled Unclassified Information (CUI) within the Defense Industrial Base (DIB) sector. Conduct pathfinders and pilots with Services, Agencies, and international partners to support risk reduction for the phased rollout of the CMMC.

Conduct pathfinders to assess and demonstrate emerging capabilities for supply chain risk management and DIB cybersecurity. Partner with the DIB sector to analyze and demonstrate promising and cost-effective capabilities and candidate solutions. Also, work with the DoD stakeholders and appropriate organizations dedicated to enhancing the training and education of cybersecurity best practices to the DIB sector with an emphasis on small businesses and manufacturers.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: DIB Secure Cloud Managed Services Pilot	11.763	0.000	-
Description: FY 2021 Accomplishments: <ul style="list-style-type: none"> - Updated and implemented the Cybersecurity Maturity Model Certification (CMMC) risk-based framework to enhance the cybersecurity posture of the Defense Industrial Base (DIB) sector. - Adjudicated public comments received in response to the Defense Federal Acquisition Regulation Supplement (DFARS) Interim Rule and coordinated draft responses with DoD stakeholders. - Coordinated with and supported the Military Services and the DoD Components on identifying nominations for CMMC Pilots with expected contract awards in FY 2021. - Coordinated with International Partners regarding their DIB cybersecurity efforts and the potential implementation or reciprocity of CMMC in their respective countries. - Developed and fielded the CMMC Enterprise Mission Assurance Support Service (eMASS) Minimal Viable Product to enable third party assessment organizations to securely upload and store assessment data and reports. Worked with DISA to test and refine the CMMC eMASS database and define the required CMMC data standards. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604771D8Z / <i>Joint Tactical Information Distribution System (JTIDS)</i>	Project (Number/Name) 028 / <i>Cybersecurity: Cybersecurity Maturity Model Certification (CMMC) and Pathfinders</i>		
B. Accomplishments/Planned Programs (\$ in Millions) - Supported a DoD internal review of CMMC implementation tasked with developing recommendations to reduce barriers to entry for small DIB contractors and ensure successful execution. Supported an CMMC Executive Steering Group to finalize recommendations and provide to DoD leadership. FY 2022 Plans: Funding realigned to 0606771D8Z. FY 2022 to FY 2023 Increase/Decrease Statement: N/A		FY 2021	FY 2022	FY 2023
Accomplishments/Planned Programs Subtotals		11.763	0.000	-
C. Other Program Funding Summary (\$ in Millions) N/A Remarks D. Acquisition Strategy N/A				

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022		
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0604771D8Z / <i>Joint Tactical Information Distribution System (JTIDS)</i>				Project (Number/Name) 028 / <i>Cybersecurity: Cybersecurity Maturity Model Certification (CMMC) and Pathfinders</i>				

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost		Cost To Complete	Total Cost	Target Value of Contract
Management Services/ Support	C/Various	OUSD OCISO (A) : Pentagon/Mark Center	12.771	11.763		0.000		-		-		-	-	Continuing	Continuing	-
Subtotal			12.771	11.763		0.000		-		-		-	-	Continuing	Continuing	N/A

			Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			12.771	11.763	0.000	-	-	-	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense										Date: April 2022				
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0604771D8Z / Joint Tactical Information Distribution System (JTIDS)					Project (Number/Name) 028 / Cybersecurity: Cybersecurity Maturity Model Certification (CMMC) and Pathfinders				

FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

DIB Secure Managed Services Pilot																												
Cybersecurity: Cybersecurity Maturity Model Certification (CMMC) and Pathfinders																												

FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

DIB Secure Managed Services Pilot																												
Cybersecurity: Cybersecurity Maturity Model Certification (CMMC) and Pathfinders																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604771D8Z / <i>Joint Tactical Information Distribution System (JTIDS)</i>	Project (Number/Name) 028 / <i>Cybersecurity: Cybersecurity Maturity Model Certification (CMMC) and Pathfinders</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>DIB Secure Managed Services Pilot</i>				
Cybersecurity: Cybersecurity Maturity Model Certification (CMMC) and Pathfinders	4	2019	3	2021

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0605022D8Z I Defense Exportability Features (DEF) Program
--	--

COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	29.642	12.649	5.416	10.145	0.000	10.145	19.234	16.853	15.820	15.571	-	-
013: Defense Exportability Features (DEF) Program	29.642	12.649	5.416	10.145	0.000	10.145	19.234	16.853	15.820	15.571	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Defend the Homeland, and Build Sustainable and Long-Term Advantage.

The DEF Program funds activities to support identification of major defense acquisition programs for possible export and the planning for design and incorporation of exportability features during the research and development phases of these programs. Features include, but are not limited to, technology and engineering design activities such as capability differentials, anti-tamper, system assurance, and software assurance. Activities include the development of program protection strategies for the program; the design and incorporation of exportability features into the system; implementation of exportability requirements into contracts; and other research, development, test, and evaluation activities.

Defense exportability features play a critically important role in DoD efforts to build partnership capacity. Funds support building joint and coalition environments by enabling the export of DoD systems to a wide range of partner nations, resulting in improved security and interoperability. In addition to the operational benefits, by providing these resources up front, the United States and partner nations will save significant resources by more efficiently designing and producing exportable U.S. systems.

Experience has shown that failure to identify the full range of Critical Program Information (CPI) early in a DoD program's design phase can drive major affordability and schedule problems later when programs have to "retrofit" program protection measures prior to export. Early development of export variants, including systems design approaches to integrate exportable anti-tamper protection and differential capability requirements to lower production costs, makes it possible to improve quality and timely deliveries to allies and friends and may enhance U.S. industry share of the global marketplace.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
0400: Research, Development, Test & Evaluation, Defense-Wide I BA 5: System Development & Demonstration (SDD)		PE 0605022D8Z I Defense Exportability Features (DEF) Program			
B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	12.920	5.447	0.000	0.000	0.000
Current President's Budget	12.649	5.416	10.145	0.000	10.145
Total Adjustments	-0.271	-0.031	10.145	0.000	10.145
• Congressional General Reductions	-	-0.031			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.271	-			
• Adjustments to Budget Year	-	-	10.145	0.000	10.145
Change Summary Explanation					
FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0605022D8Z / Defense Exportability Features (DEF) Program				Project (Number/Name) 013 / Defense Exportability Features (DEF) Program			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
013: Defense Exportability Features (DEF) Program	29.642	12.649	5.416	10.145	0.000	10.145	19.234	16.853	15.820	15.571	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The DEF Program funds activities to support identification of major defense acquisition programs for possible export and the planning for design and incorporation of exportability features during the research and development phases of these programs. Features include, but are not limited to, technology and engineering design activities such as capability differentials, anti-tamper, system assurance, and software assurance. Activities include the development of program protection strategies for the program; the design and incorporation of exportability features into the system; implementation of exportability requirements into contracts; and other research, development, test, and evaluation activities.

Defense exportability features play a critically important role in the DoD efforts to build partnership capacity. Funds support building joint and coalition environments by enabling the export of the DoD systems to a wide range of partner nations, resulting in improved security and interoperability. In addition to the operational benefits, by providing these resources up front, the United States and partner nations will save significant resources by more efficiently designing and producing exportable U.S. systems.

Experience has shown that failure to identify the full range of Critical Program Information (CPI) early in a DoD program's design phase can drive major affordability and schedule problems later when programs have to "retrofit" program protection measures prior to export. Early development of export variants, including systems design approaches to integrate exportable anti-tamper protection and differential capability requirements to lower production costs, makes it possible to improve quality and timely deliveries to allies and friends and may enhance U.S. industry share of the global marketplace.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: DEF Program	12.649	5.416	10.145	0.000	10.145
Description: The DEF Program enables the DoD programs to develop and incorporate technology protection features in designated systems during the research and development phase of such systems to prepare them for export. By facilitating the export of U.S. defense systems, the DoD enhances the U.S. defense industrial base, strengthens the military capabilities of U.S. allies around the world, and increases coalition interoperability.					
FY 2022 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022		
Appropriation/Budget Activity 0400 / 5		R-1 Program Element (Number/Name) PE 0605022D8Z / Defense Exportability Features (DEF) Program		Project (Number/Name) 013 / Defense Exportability Features (DEF) Program		
B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Provide follow-on funding to the Army's Indirect Fire Protection Capability Increment 2 (IFPC Inc 2) and Low slow small counter unmanned aircraft system Integrated Defeat System (LIDS) programs and the Navy's Tactical Combat Training System Increment Two (TCTS II) program. FY 2023 Base Plans: Provide funding to help the DoD programs plan for exportability in line with recent changes to the DoD guidance, including the DoD Instruction (DoDI) 5000.85 Major Capability Acquisition that requires the DoD programs to design their systems for exportability as the default acquisition approach and the updated Joint Capabilities Integration and Development System (JCIDS) manual that integrates exportability into the DoD requirements planning process. In particular, support several modernization priority programs to plan for exportability to allies and partners. FY 2023 OCO Plans: N/A FY 2022 to FY 2023 Increase/Decrease Statement: The FY 2022 to FY 2023 increase of \$4.698 million is driven by Departmental priorities to expand exportability efforts and supports the March 2021 Interim National Security Strategic Guidance to ensure the U.S. is ready to work with allies and share responsibilities equitably to address common threats.						
Accomplishments/Planned Programs Subtotals		12.649	5.416	10.145	0.000	10.145
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks						
D. Acquisition Strategy N/A						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0605022D8Z / Defense Exportability Features (DEF) Program					Project (Number/Name) 013 / Defense Exportability Features (DEF) Program				

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
DEF	TBD	Various : Various	29.642	12.649		5.416		10.145		0.000		10.145	-	-	-
Subtotal			29.642	12.649		5.416		10.145		0.000		10.145	-	-	N/A

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	29.642	12.649		5.416		10.145	-	-	N/A

Remarks
 N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605022D8Z / <i>Defense Exportability Features (DEF) Program</i>	Project (Number/Name) 013 / <i>Defense Exportability Features (DEF) Program</i>	

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<i>Defense Exportability Features (DEF)</i>																												
FY 2021 Project Execution																												
FY 2022 Project Selection																												
FY 2022 Project Execution																												
FY 2023 Project Selection																												
FY 2023 Project Execution																												
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FY 2027 Project Selection																												
FY 2027 Project Execution																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605022D8Z / <i>Defense Exportability Features (DEF) Program</i>	Project (Number/Name) 013 / <i>Defense Exportability Features (DEF) Program</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Defense Exportability Features (DEF)</i>				
FY 2021 Project Execution	1	2021	4	2022
FY 2022 Project Selection	4	2021	4	2021
FY 2022 Project Execution	1	2022	4	2023
FY 2023 Project Selection	4	2022	4	2022
FY 2023 Project Execution	1	2023	4	2024
FY 2024 Project Selection	4	2023	4	2023
FY 2024 Project Execution	1	2024	4	2025
FY 2025 Project Selection	4	2024	4	2024
FY 2025 Project Execution	1	2025	4	2026
FY 2026 Project Selection	4	2025	4	2025
FY 2026 Project Execution	1	2026	4	2027
FY 2027 Project Selection	4	2026	4	2026
FY 2027 Project Execution	1	2027	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 5: System Development & Demonstration (SDD)</i>	PE 0605027D8Z I OUSD(C) IT Development Initiative											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	95.903	9.883	16.892	5.938	-	5.938	5.425	5.614	6.279	4.735	Continuing	Continuing
927: <i>Next Generation Resource Management System</i>	46.003	3.845	4.293	5.938	-	5.938	5.425	5.614	6.279	4.735	Continuing	Continuing
930: <i>Advanced Analytics (Advana)</i>	49.900	6.038	12.599	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

New Start (Y/N): No

Effective February 1, 2022 the Department of Defense established the position of the Chief Digital and Artificial Intelligence Officer and the Office of the Chief Digital and Artificial Intelligence Officer (OCDAO), tasked with serving as the Department's senior official, and a Principal Staff Assistant, responsible for strengthening and integrating data, artificial intelligence, and digital solutions. The realignment of \$23.091 million within the Office of the Secretary of Defense resources supports the consolidation of the Department's existing functional efforts in order to align manpower and funding under the OCDAO.

A. Mission Description and Budget Item Justification

As the Department of Defense's strategic, operational, and tactical plans and objectives transform the war fighter with new capabilities and doctrine, the budgeting and accountability of funds used to pursue the Department objectives will become more complicated and detailed for senior leaders to make decisions with supporting rationale for the taxpayer. Incorporating information technology toward current and emerging business processes manifesting into a state-of-the art system of systems will result in increasing efficiencies, timely diagnostics, and reducing lifecycle costs to maintain, sustain and repair.

This initiative exploits emerging technology, processes, trends, capabilities, and techniques to incorporate state-of-the-art information technology enabling the ability, agility, and level of fidelity to collect, process, administrate and report resource management data and to automate business processes within a more robust analytical environment within the Office of the Under Secretary of Defense (Comptroller) (OUSD(C)).

Next Generation Resource Management Systems (NGRMS):

The OUSD(C) is responsible for advising the Secretary of Defense on all Defense budgetary and fiscal matters, for Defense budget development and execution, and for overseeing financial management across the Department. The OUSD(C) has a broad set of responsibilities in supporting the Planning, Programing, Budget and Execution (PPBE) process. The Office of the Director, Cost Assessment and Program Evaluation (CAPE), provides independent analytic advice to the Secretary of Defense on all aspects of the Defense program, including alternative weapon systems and force structures, the development and evaluation of program and defense program alternatives, and the cost-effectiveness of defense systems. There is a critical need for the development of a state-of-the-art information technology system to modernize and replace multiple, antiquated legacy systems and processes used to formulate, justify, present and defend the entire Department of Defense budget in

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 5: System Development & Demonstration (SDD)</i>		R-1 Program Element (Number/Name) PE 0605027D8Z I <i>OUSD(C) IT Development Initiative</i>
<p>the OUSD(C) to meet Title 10 and Title 31 mission and reporting requirements. The Comptroller's plan for mitigating the deficiencies and capability gaps associated with current systems is the development of the NGRMS.</p> <p>The OUSD(C) and CAPE use multiple systems to formulate, justify, distribute, and execute the DoD budgets. The information managed by the budget formulation and programming systems is redundant, and reconciliation of information is difficult and inefficient. These systems require extensive manpower investments to give executives the information they need to make key financial decisions in a timely manner. The OUSD(C) and CAPE require a more efficient, effective Defense budget environment that optimizes the budget cycle to ensure users are processing and reporting efficiently, and DoD Senior Leadership has the information to make informed, critical decisions.</p> <p>The OUSD(C) requires capabilities that shall provide for the effective formulation, and justification of the Defense budget to be adaptable and modern. The requirement is for:</p> <ul style="list-style-type: none"> • Automated exchange and reconciliation of budget data • Improved efficiency through the utilization of a unified budgetary model • Instantaneous ability to generate data for management reviews and decisions • Capability to accommodate emerging business practices • Agile methods to launch and terminate new development efforts more quickly • Seamlessly combine the outputs of multiple efforts at various levels of maturity for organizational responsiveness and alternative resource allocation for innovation adoption <p>To date, a new system has been developed and deployed, and is continuously being tested by the Department of the Army, the Defense Advanced Research Projects Agency (DARPA) and eight smaller defense-wide agencies, with submission parallels scheduled for the Department of the Navy and the Department of the Air Forces, as early as the end of the 2nd quarter of FY 2022. Moving forward, the new system shall be designed as a single system with a unified data source for OUSD(C) and CAPE, which will support the reforming and modernizing of the Planning, Programming, Budgeting, and Execution (PPBE) process. The new system shall provide a single, integrated system that employs the latest technologies to fulfill the Department's financial management responsibilities in an effective, efficient, and adaptable manner. The new system's agile development approach shall compliment the continuous and ongoing studies and changes to the PPBE and appropriation processes to prevent stagnant complexities. The new system shall provide twenty-first century information technology that shall allow users to view information from multiple fully integrated modules simultaneously, e.g., current year budget submission, decision documents from previous years, and budget execution information.</p> <p>Advanced Analytics (Advana):</p> <p>Advana is a technology platform that not only houses a collection of enterprise data, but expands the boundaries of a standard data warehouse by arming military and business decision-makers with decision support analytics, visualizations, and data tools. Advana has been designated the single enterprise authoritative data management and analytics platform for the Secretary of Defense, Deputy Secretary of Defense, and Principal Staff Assistants (PSAs), with inputs from all DoD Components. This positions Advana to enable the OUSD(C)'s "CFO of the Future" vision, the DoD Data Strategy, Creating Data Advantage memo (5 May 2021), and</p>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605027D8Z I OUSD(C) IT Development Initiative
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Memorandum on Accelerating data and Artificial Intelligence for the Warfighter (21 June 2021), all aimed at achieving the National Defense Strategy by advancing analytics throughout the DoD. Advana directly supports the DoD's financial statement audit as the single repository for financial accounting data across the Department and serves numerous other analytical use cases aligned to the National Defense Strategy.

B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	10.259	16.892	0.000	-	0.000
Current President's Budget	9.883	16.892	5.938	-	5.938
Total Adjustments	-0.376	0.000	5.938	-	5.938
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Year	-0.376	-	5.938	-	5.938

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Effective February 1, 2022 the Department of Defense established the position of the Chief Digital and Artificial Intelligence Officer and the Office of the Chief Digital and Artificial Intelligence Officer (OCDAO), tasked with serving as the Department's senior official, and a Principal Staff Assistant, responsible for strengthening and integrating data, artificial intelligence, and digital solutions. The realignment of \$23.091 million within the Office of the Secretary of Defense resources in FY 2023 from OUSD (C) to CDAO supports the consolidation of the Department's existing functional efforts in order to align manpower and funding under the OCDAO.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0605027D8Z / OUSD(C) IT Development Initiative				Project (Number/Name) 927 / Next Generation Resource Management System			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
927: Next Generation Resource Management System	46.003	3.845	4.293	5.938	-	5.938	5.425	5.614	6.279	4.735	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Office of the Under Secretary of Defense (Comptroller) (OUSD(C)) is responsible for advising the Secretary of Defense on all Defense budgetary and fiscal matters, for Defense budget development and execution, and for overseeing financial management across the Department. The OUSD(C) has a broad set of responsibilities in supporting the Planning, Programming, Budget and Execution (PPBE) process. The Office of the Director, Cost Assessment and Program Evaluation (CAPE), provides independent analytic advice to the Secretary of Defense on all aspects of the Defense program, including alternative weapon systems and force structures, the development and evaluation of programs and defense program alternatives, and the cost-effectiveness of defense systems.

OUSD(C) and CAPE use multiple systems to formulate, justify, distribute, and execute DoD budgets. The information managed by the budget formulation and programming systems is redundant, and reconciliation of information is difficult and inefficient. These systems require extensive manpower investments to give executives the information they need to make key financial decisions in a timely manner. The OUSD(C) and CAPE require a more efficient, effective Defense budget environment that optimizes the budget cycle to ensure users are processing and reporting efficiently and DoD Senior Leadership has the information to make informed, critical decisions.

The OUSD(C) requires capabilities that shall provide for the effective formulation, and justification of the Defense budget to be adaptable and modern. This includes the following:

- Automated exchange and reconciliation of budget data
- Improved efficiency through the utilization of a unified budgetary model
- Instantaneous ability to generate data for management reviews and decisions
- Capability to accommodate emerging business practices
- Agile methods to launch and terminate new development efforts more quickly
- Seamlessly combine the outputs of multiple efforts at various levels of maturity for organizational responsiveness and alternative resource allocation for innovation adoption

To date, a new system has been developed and deployed, and is continuously being tested by the Department of the Army, the Defense Advanced Research Projects Agency (DARPA) and eight smaller defense-wide agencies, with submission parallels scheduled for the Department of the Navy and the Department of the Air Forces, as early as the end of the 2nd quarter of FY 2022. Moving forward, the new system shall be designed as a single system with a unified data source for OUSD(C) and CAPE, which will support the reforming and modernizing of the Planning, Programming, Budgeting, and Execution (PPBE) process. The new system shall provide a single, integrated system that employs the latest technologies to fulfill the Department's financial management responsibilities in an effective, efficient, and adaptable

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605027D8Z / OUSD(C) IT Development Initiative	Project (Number/Name) 927 / Next Generation Resource Management System	
<p>manner. The new system's agile development approach shall compliment the continuous and ongoing studies and changes to the PPBE and appropriation processes to prevent stagnant complexities. The new system shall provide twenty-first century information technology that shall allow users to view information from multiple fully integrated modules simultaneously, e.g., current year budget submission, decision documents from previous years, and budget execution information.</p>			
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>Title: Next Generation Resource Management System</p> <p>Description: Plan, develop, test and evaluate the system components (i.e. unified database, expert system, cross domain security, enterprise service bus, applications, services) and supportability requirements in modernizing the budget formulation, programming execution and reporting capabilities for the Department of Defense. Activities will include, but not be limited to, the preparation of all documentation required for Clinger-Cohen Compliance and acquisition regulations, developing requests for proposals, and oversight and management of contracts and deliverables.</p> <p>FY 2022 Plans: FY 2022 planned development will include all necessary cyber security enhancements, the full integration of the CAPE Manpower Tool, anticipated PPBE reform improvements, and various iterative development initiatives in support of the changing budget requirements, with additional 4th Estate agencies spiraling into the tool as early as the end of the 1st quarter of FY 2022.</p> <p>FY 2023 Plans: FY 2023 planned development will include all necessary cyber security enhancement, the spiraling on of additional agencies, and the streamlining of business processes to better support the changing budget requirements, based on the capabilities provide by the fully integrated system across OUSD(C) and CAPE, in support of Comptroller's reform and modernization efforts.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The \$1.440M increase for NGRMS from FY 2022 to FY 2023 is to accelerate the for development and integration to support the Comptroller's efforts to reform and modernize the existing Planning, Programming, Budgeting, and Execution (PPBE) and appropriation processes.</p>		3.845	4.293
Accomplishments/Planned Programs Subtotals		3.845	4.293
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy Agile development to replace legacy mission subsystems capabilities. Current development effort is provided by KPMG contract # HQ0034-21-F-0254, period of performance June 21, 2021 – June 20, 2023.			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0605027D8Z / OUSD(C) IT Development Initiative						Project (Number/Name) 927 / Next Generation Resource Management System			
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development	C/FFP	OUSD(C) : Pentagon & Contractor Off-site Facility	46.003	3.845		4.293		5.938		-		5.938	Continuing	Continuing	Continuing
Subtotal			46.003	3.845		4.293		5.938		-		5.938	Continuing	Continuing	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			46.003	3.845		4.293		5.938		-		5.938	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense

Date: April 2022

Appropriation/Budget Activity

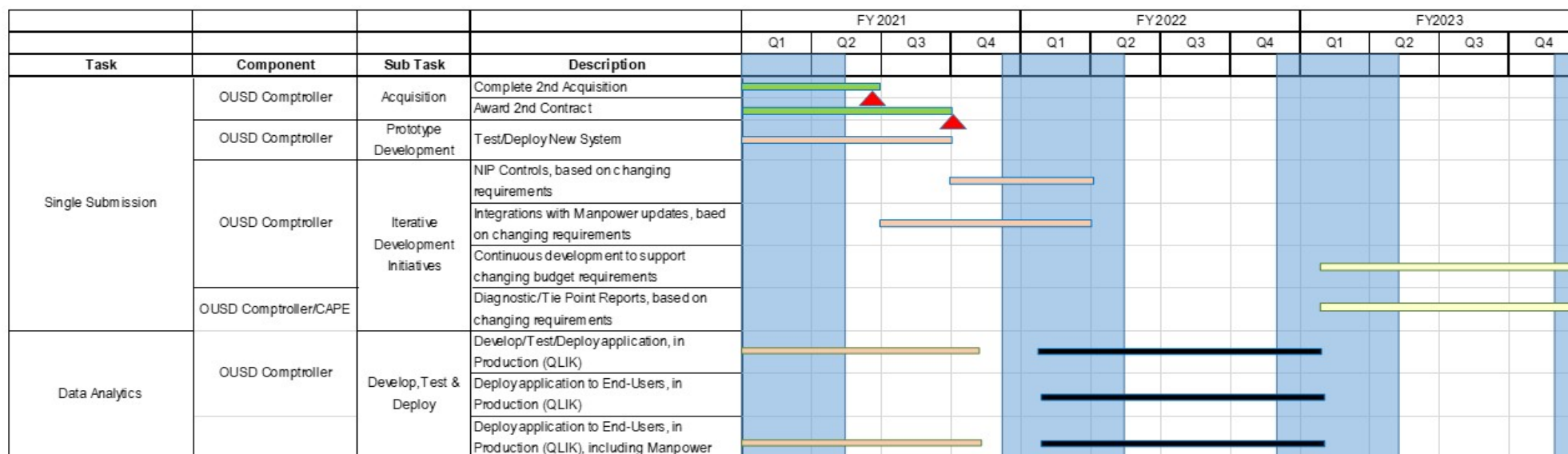
0400 / 5

R-1 Program Element (Number/Name)

PE 0605027D8Z / OUSD(C) IT Development Initiative

Project (Number/Name)

927 / Next Generation Resource Management System



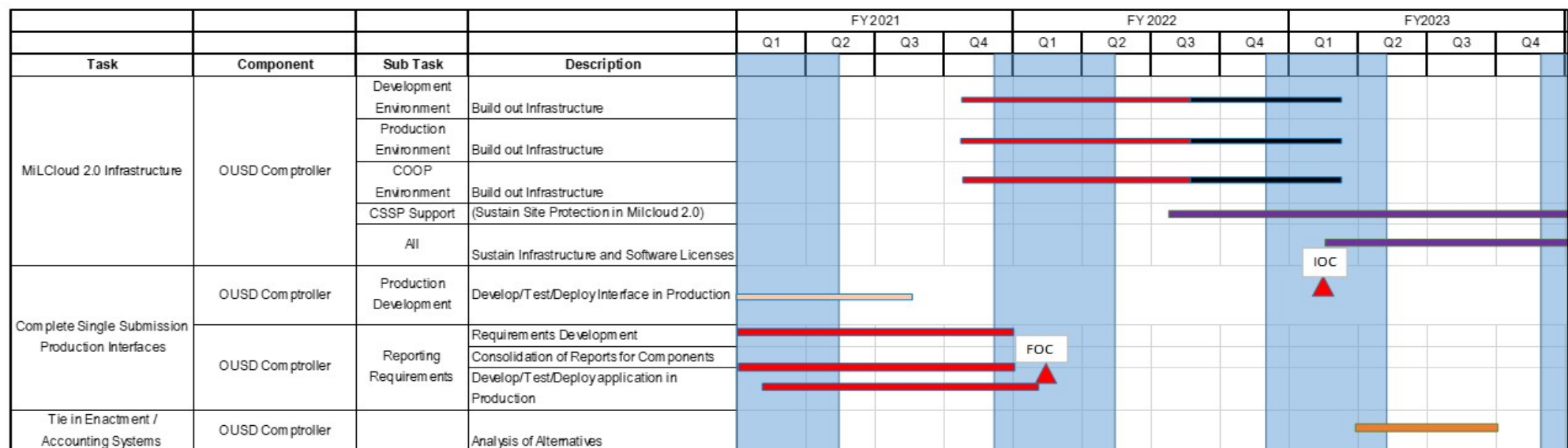
NGRMS Funding Legend

Government Personnel	
FY20 RDT&E Funds	
FY22 RDT&E Funds	
FY23 and Out RDT&E Funds	

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605027D8Z / OUSD(C) IT Development Initiative	Project (Number/Name) 927 / Next Generation Resource Management System
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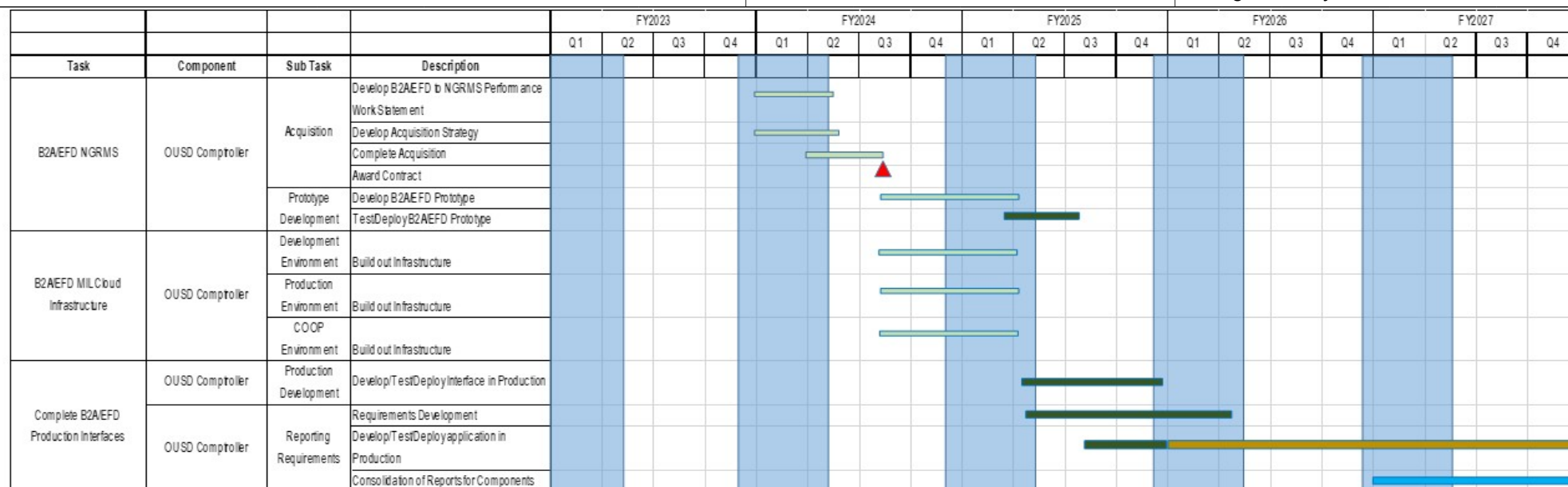
Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense

Date: April 2022

Appropriation/Budget Activity
0400 / 5

R-1 Program Element (Number/Name)
PE 0605027D8Z / OUSD(C) IT Development Initiative

Project (Number/Name)
927 / Next Generation Resource Management System



NGRMS Funding Legend	
FY24 and Out RDT&E Funds	
FY25 and Out RDT&E Funds	
FY26 and Out RDT&E Funds	
FY27 and Out RDT&E Funds	

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605027D8Z / OUSD(C) IT Development Initiative	Project (Number/Name) 927 / Next Generation Resource Management System	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
NGRMS				
Legacy Development (discontinued)	1	2017	3	2018
Single Submission	3	2018	4	2026
Data Analytics	1	2022	1	2023
MilCloud Infrastructure Buildout	4	2021	1	2023
Complete Single Submission Product Interfaces	4	2021	1	2022
Tie in Enactment/Accounting System	2	2023	3	2023
B2A/EFD NGRMS	1	2024	3	2025
B2A/EFD MILCloud Infrastructure	3	2024	1	2025
Complete B2A/EFD Production Interfaces	2	2025	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0605027D8Z / OUSD(C) IT Development Initiative				Project (Number/Name) 930 / Advanced Analytics (Advana)			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
930: Advanced Analytics (Advana)	49.900	6.038	12.599	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Effective February 1, 2022 the Department of Defense established the position of the Chief Digital and Artificial Intelligence Officer and the Office of the Chief Digital and Artificial Intelligence Officer (OCDAO), tasked with serving as the Department's senior official, and a Principal Staff Assistant, responsible for strengthening and integrating data, artificial intelligence, and digital solutions. The realignment of \$23.091 million in FY 2023 within the Office of the Secretary of Defense resources from OUSD(C) to CDAO supports the consolidation of the Department's existing functional efforts in order to align manpower and funding under the OCDAO.

A. Mission Description and Budget Item Justification

The Department of Defense is currently facing an unprecedented set of operating challenges. An increasingly complex security environment, aggression from adversaries in every operating domain, and a diminished current readiness posture caused by both persistent armed conflict and the COVID-19 pandemic, which has threatened the health and welfare of the Department's greatest asset, its military and civilian workforce. In the past, it was nearly impossible for a single DoD data platform to meet the demand for the enterprise-wide common operating pictures (COPs) needed to deliver strategic insights based on timely data to help address these challenges. However, over the past two years, the Advana program has proven that it is uniquely positioned as a strategic asset and critical enabler for modernizing the data and analytics culture at DoD, providing effortless access to data and tools with the transparency required to rapidly understand results and make decisions in support of the National Defense Strategy priorities.

Advana provides a single repository for Common Enterprise Data to support the TI97 General Fund for the 4th Estate. Without Advana, the Department will be incapable of asserting readiness for an independent audit of the consolidated financial statements. Advana is positioned to support all DoD organizations pursuing unmodified opinions on their full financial statement audits. Without an automated capability to provide a transactional universe for sampling and related evidentiary proof, the Department will not be in compliance with public law.

Since 2020, Advana's efforts have directly supported the Secretary's priorities, enabling Data Advantage for diverse business and mission needs:

- Transformed previously paper-based leadership reporting to data-driven, digital dashboards using Advana's visualization tools, now exclusively used for the Deputy's Management Action Group (DMAG) and other leadership Working Group meetings.
- Expanded support for DoD's Coronavirus Task Force (CVTF), enhancing the initial common operating picture (COP) to a suite of 12 applications used for combatting COVID-19.
- Rapidly prototyped a Climate Change application in partnership with DoD's climate experts to support decision-making focused on confronting the climate crisis, a key priority for the current administration.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605027D8Z I OUSD(C) IT Development Initiative	Project (Number/Name) 930 I Advanced Analytics (Advana)		
<ul style="list-style-type: none">Expanded collaborations with Military Personnel Policy, Civilian Personnel Policy, and Defense Civilian Personnel Advisory Service to measure performance and analyze trends related to the entire spectrum of talent management activities including manpower planning, recruitment, hiring, placement, development, evaluation, and retention.Developed tools to track status of relations and cooperation with foreign countries through Foreign Military Sales (FMS), Professional Military Education (PME), Burden Sharing and more, created in collaboration with DSCA.Established additional partnerships to provide financial statement audit Universes of Transactions (UoTs). <p>Using Advana’s central data platform with right-time data, data tools, and other self-service products, leaders are simplifying solutions and putting the power of analytics in the pocket of every analyst and decision-making authority at the DoD.</p> <p>The requested funds will be used to buy “Big Data” software, cloud infrastructure, and required contractor services to develop, test, and implement the technology to meet the expanding requirements. These funds also include subject matter expertise costs for the DCFO and funds to be placed on a contract for cloud services, software, and labor. This will not result in hiring additional government personnel.</p> <p>Going forward, the Advana data platform seeks to continue serving as the DoD’s enterprise-level analytics solution and expand to over 100,000 users and 500 systems. Additional investment will allow Advana to continue supporting programmatic growth, including infrastructure enhancements, additional analytical tools, and the subject matter experts needed to develop these critical resources. Together, we will harness the power of DoD’s enterprise data to help transform all functions of the Department thereby, protecting DoD’s workforce, safeguarding U.S. citizens, defending allies and partners, and improving the affordability, effectiveness, and speed of our operations.</p>				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Title: Advanced Analytics (Advana)		6.038	12.599	0.000
Description: Over the next two fiscal years, Advana is committed to ensuring that a performant, secure, flexible, enterprise-wide data analytics solution is available for the DoD analyst community. This includes providing cloud-based environments and COTS tool options on NIPR, SIPR, and JWICS, as well as having trained service desk staff, data scientists, and a managed data service team available to assist users, as needed.				
Funds will be used to support increments sixteen through twenty-one, per the schedule, as described below.				
FY 2022 Plans: FY 2022 planned development will allow for expansion of Advana’s JWICS Cloud environment, which will enable additional highly classified data analysis with similar analytics tools seen on the NIPR and SIPR environments. Additionally, the team will continue expanding the number of solutions available on all environments, expanding/enhancing security controls, and expand the number of DoD stakeholders served.				
FY 2023 Plans:				

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605027D8Z / OUSD(C) IT Development Initiative	Project (Number/Name) 930 / Advanced Analytics (Advana)	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>FY 2023 planned development will occur under the Chief Digital and Artificial Intelligence Office to allow for the continued expansion and scaling of Advana's platforms on NIPR, SIPR, and JWICS, including the addition of new data sources, development of analytics in "new" functional areas (e.g., Assessments, Intelligence, Mission Operations), and establishment of new enclaves and capabilities to support a multitude of new requirements. Advana will partner with Combatant Commands to increase adoption of the department's Data Analytics capabilities, providing global analytics development and integration support in accordance with the Memorandum on Accelerating Data and Artificial Intelligence for the Warfighter (21 June 2021). Advana will also partner with DoD component leaders to develop additional Common Operating Pictures that inform crisis response, improve resource management and readiness, and support leadership decisions in complex operating environments. Finally, the team will continue to drive improvements in data automation, platform and data security, and support the proliferation of artificial intelligence, machine learning, and natural language processing capabilities across the platform.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> FY 2023 realigns \$23.091 million from OUSD(C) to the Chief Digital and Artificial Intelligence Office to provide digital solutions for the joint forces and centralizes advancing analytics (ADVANA) under CDAO.</p>			
Accomplishments/Planned Programs Subtotals		6.038	12.599
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022		
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0605027D8Z / OUSD(C) IT Development Initiative				Project (Number/Name) 930 / Advanced Analytics (Advana)				

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development	C/TBD	OUSD(C) : Pentagon	49.900	6.038	Aug 2021	12.599		0.000		-		0.000	Continuing	Continuing	-
Subtotal			49.900	6.038		12.599		0.000		-		0.000	Continuing	Continuing	N/A

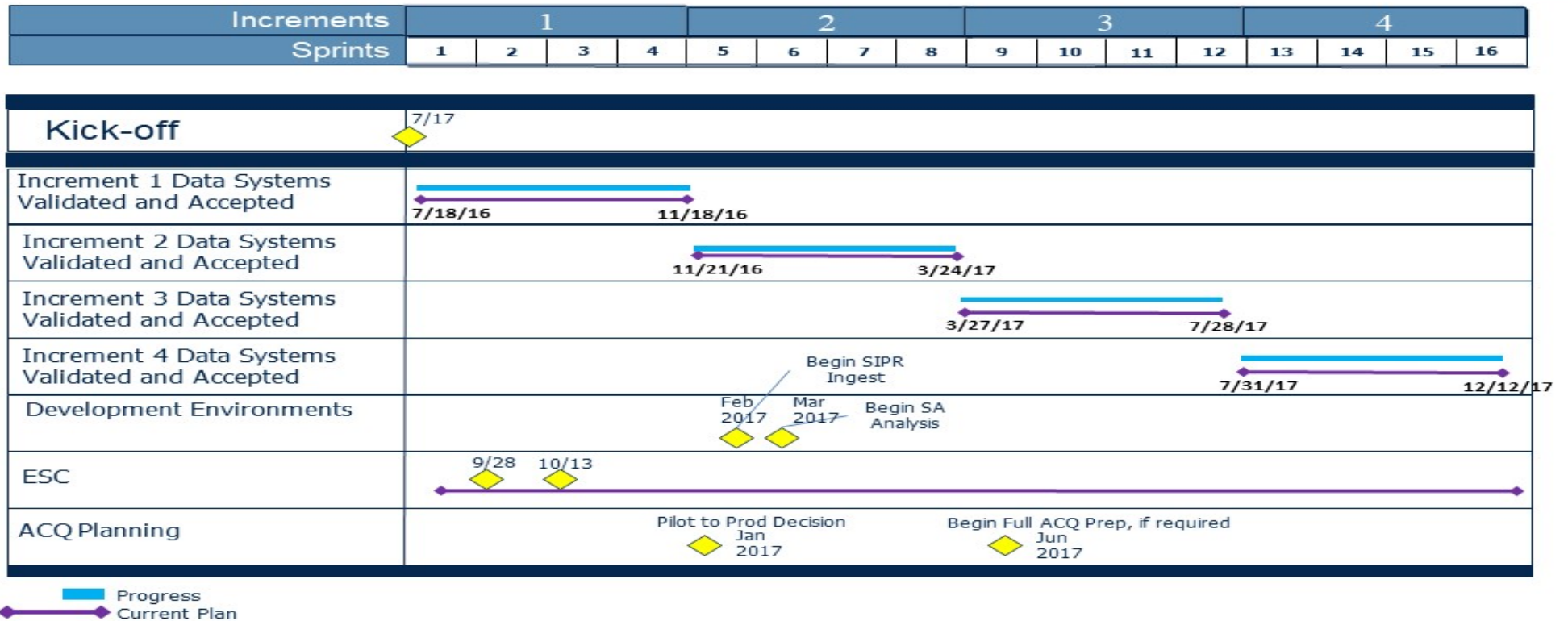
	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	49.900	6.038	12.599	0.000	-	0.000	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense										Date: April 2022					
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0605027D8Z / OUSD(C) IT Development Initiative					Project (Number/Name) 930 / Advanced Analytics (Advana)					

ADVANA Schedule Overview








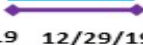
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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605027D8Z / OUSD(C) IT Development Initiative	Project (Number/Name) 930 / Advanced Analytics (Advana)

ADVANA Schedule Overview Cont.

Increments	5				6				7						8	9	10
Sprints	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31 - 38	39 - 46	47 - 55

Increment 5 Data Systems including cost management Validated and Accepted																
Increment 6 Data Systems Validated and Accepted including DATA Act																
Increment 7 Data Systems including Performance Validated and Accepted																
Increment 8 Data Systems including Readiness Validated and Accepted																
Increment 9 Data Systems including Readiness Validated and Accepted																
Increment 10 Data Systems Validated and Accepted																

 Progress
 Current Plan









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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605027D8Z / OUSD(C) IT Development Initiative	Project (Number/Name) 930 / Advanced Analytics (Advana)

ADVANA Schedule Overview Cont.

Increments	11	12	13	14	15	16	17	18
Sprints	56 - 64	65 - 73	74 - 82	83 - 91	92 - 100	100 - 108	109 - 117	118 - 126

Increment 11 Data Systems Validated and Accepted	
Increment 12 Data Systems Validated and Accepted	
Increment 13 Data Systems Validated and Accepted	
Increment 14 Data Systems Validated and Accepted	
Increment 15 Data Systems Validated and Accepted	
Increment 16 Data Systems Validated and Accepted	
Increment 17 Data Systems Validated and Accepted	
Increment 18 Data Systems Validated and Accepted	

 Progress
 Current Plan

Slide: 3

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605027D8Z / OUSD(C) IT Development Initiative	Project (Number/Name) 930 / Advanced Analytics (Advana)

ADVANA Schedule Overview Cont.

Increments	19	20	21	22	23	24	25	26
Sprints	127 - 135	136 - 144	145 - 153	154 - 162	163 - 181	182 - 190	191 - 199	200 - 208

Increment 19 Data Systems Validated and Accepted	9/18/22 1/21/23
Increment 20 Data Systems Validated and Accepted	1/22/23 5/27/23
Increment 21 Data Systems Validated and Accepted	5/28/23 9/17/23
Increment 22 Data Systems Validated and Accepted	9/18/23 1/17/24
Increment 23 Data Systems Validated and Accepted	1/18/24 5/27/24
Increment 24 Data Systems Validated and Accepted	5/28/24 9/17/24
Increment 25 Data Systems Validated and Accepted	9/18/24 1/17/25
Increment 26 Data Systems Validated and Accepted	1/18/25 5/27/25

 Progress
 Current Plan

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605027D8Z / OUSD(C) IT Development Initiative	Project (Number/Name) 930 / Advanced Analytics (Advana)

ADVANA Schedule Overview Cont.

Increments	27	28	29	30	31	32	33	34
Sprints	209 - 217	218 - 226	227 - 235	236 - 244	245 - 253	254 - 262	263 - 271	272 - 280

Increment 27 Data Systems Validated and Accepted	5/28/25 9/17/25
Increment 28 Data Systems Validated and Accepted	9/18/25 1/17/26
Increment 29 Data Systems Validated and Accepted	1/18/26 5/27/26
Increment 30 Data Systems Validated and Accepted	5/28/26 9/17/26
Increment 31 Data Systems Validated and Accepted	9/18/26 1/17/27
Increment 32 Data Systems Validated and Accepted	1/18/27 5/27/27
Increment 33 Data Systems Validated and Accepted	5/28/27 9/17/27
Increment 34 Data Systems Validated and Accepted	9/18/27 1/17/27

 Progress
 Current Plan

Slide: 5

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605027D8Z / OUSD(C) IT Development Initiative	Project (Number/Name) 930 / Advanced Analytics (Advana)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Acquisiiton Milestone				
Development and ingest further data	3	2021	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 5: System Development & Demonstration (SDD)					R-1 Program Element (Number/Name) PE 0605075D8Z I CMO Policy and Integration							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	96.763	1.295	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	-
075: CMO Policy and Integration	96.763	1.295	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	-

Note

New Start (Y/N): No

Starting in FY 2022 the Office of the Chief Management Officer (CMO) will be disestablished and funding and man-power resources realigned to the DA&M.

A. Mission Description and Budget Item Justification

To produce and sustain a Business Enterprise Architecture (BEA) to guide business transformation and business system investment actions for the DoD. The requirement to produce and maintain a BEA is codified in NDAA 2012, USC Title 10, Section 2222 with amplifying guidance from OMB. The proposed program provides improved capabilities to access and use the BEA information including descriptions of business processes and associated information assets; required capabilities and associated performance requirements; and governing laws, regulations and policies (LRPs).

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	1.618	0.000	0.000	-	0.000
Current President's Budget	1.295	0.000	0.000	-	0.000
Total Adjustments	-0.323	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustment	-0.323	-	-	-	-

Change Summary Explanation

Starting in FY 2022 CMO will be disestablished and funding and man-power resources realigned to the DA&M.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0605075D8Z / CMO Policy and Integrati on				Project (Number/Name) 075 / CMO Policy and Integration			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
075: CMO Policy and Integration	96.763	1.295	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note New Start (Y/N): No												
A. Mission Description and Budget Item Justification To produce and sustain a Business Enterprise Architecture (BEA) to guide business transformation and business system investment actions for the DoD. The requirement to produce and maintain a BEA is codified in the National Defense Authorization Act for 2012, USC Title 10, Section 2222 with amplifying guidance from the OMB. The proposed program provides improved capabilities to access and use the BEA information including descriptions of business processes and associated information assets; required capabilities and associated performance requirements; and governing laws, regulations and policies (LRPs).												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: CMO Policy and Integration Description: - Defined and developed engineering and information technology development plans - Established acquisition strategy and detailed implementation schedule - Vetted project plan and implementation goals objectives and outcomes within the Defense Business Council FY 2022 Plans: Starting in FY 2022 the CMO will be disestablished and funding and man-power resources realigned to the DA&M. FY 2022 to FY 2023 Increase/Decrease Statement: Starting in FY 2022 CMO will be disestablished and funding and man-power resources realigned to the DA&M.									1.295	0.000	-	
Accomplishments/Planned Programs Subtotals									1.295	0.000	-	
C. Other Program Funding Summary (\$ in Millions) N/A Remarks D. Acquisition Strategy Follow the DoD Instruction 5000.75 process for Business Systems Requirements and Acquisition.												

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022					
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0605075D8Z I CMO Policy and Integrati on						Project (Number/Name) 075 I CMO Policy and Integration					
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total					
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract		
Capability to automate and generate metadata on ingest of architecture information	Option/ CPFF	DCMO : Mark Center	0.000	0.295		-		-		-		-	-	-	-		
Extend user access to BEA via web services	Option/ CPFF	DCMO : Mark Center	6.205	0.500		-		-		-		-	-	-	-		
Port BEA into Cloud environment	Option/ CPFF	DCMO : Mark Center	90.558	0.500		-		-		-		-	-	-	-		
Subtotal			96.763	1.295		-		-		-		-	-	-	N/A		
Remarks																	
-Partial completion of this performance metric is primarily the result of challenges in meeting the DoD's Cybersecurity Risk management Framework requirements necessary to transition capabilities from our contractor development site and updated capabilities to the EKR shared services environment which is an accredited DoD computing environment. The discover functionality is operating in the contractor's development environment and is in the process of transitioning to final hosting within the EKR computing environment to complete discovery capabilities via web services.																	
-DoD CIO Memorandum of 3 May 2018 directed migration of all 4th Estate applications and systems to milCloud 2.0 by end of FY 2020. However, due to the DSD memorandum dated 24 January 2020 directing a complete review of the 4th Estate the transition was delayed until late 2021/early 2022.																	
-The Business Enterprise Architecture is related to NDS Strategic Approach number three "Reform the Department for Greater Performance and Affordability" regarding, Streamline rapid, iterative approaches from development to fielding.																	
			Prior Years	FY 2021	FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract			
Project Cost Totals			96.763	1.295	-		-		-		-	-	-	N/A			
Remarks																	
NA																	

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605075D8Z / CMO Policy and Integrati on	Project (Number/Name) 075 / CMO Policy and Integration
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Fiscal Year	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
BEA Compliance, Standards, and CMO Tools Implementations			▲ 1							▲ 1 IOC	▲ 1 FOC																	
							▲ 2				▲ 2			▲ 2				▲ 2				▲ 2						
							▲ 3				▲ 3																	
BEA computing infrastructure transition to DoD Approved Cloud Services Implementation							▲ 2																					
							▲ 2				▲ 2																	
										▲ 3				▲ 3														
											▲ 4				▲ 4													

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 5: System Development & Demonstration (SDD)</i>	PE 0605210D8Z I <i>Defense-Wide Electronic Procurement Capabilities</i>											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	94.033	7.970	7.108	6.949	-	6.949	7.034	7.186	7.341	7.304	Continuing	Continuing
021: <i>Defense-Wide Electronic Procurement Capabilities-Contingency</i>	94.033	7.970	7.108	6.949	-	6.949	7.034	7.186	7.341	7.304	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiative to Build Sustainable and Long-Term Advantage.

Defense-wide Electronic Procurement Capabilities provides for the development of critical enterprise-wide e-business requirements for the procurement community. These requirements result from statute, regulation, process re-engineering, internal control requirements, and audit findings. This program provides for the introduction of innovative, time and cost-saving technologies into procurement processes across the Department. Resources are provided to conduct agile software development and testing on new or modified defense-wide e-business applications to ensure system and application development, integration, and demonstration of production representative systems and capabilities.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	8.274	7.148	0.000	-	0.000
Current President's Budget	7.970	7.108	6.949	-	6.949
Total Adjustments	-0.304	-0.040	6.949	-	6.949
• Congressional General Reductions	-	-0.040			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.304	-			
• Adjustments to Budget Year	-	-	6.949	-	6.949

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0605210D8Z / Defense-Wide Electronic Procurement Capabilities				Project (Number/Name) 021 / Defense-Wide Electronic Procurement Capabilities- Contingency			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
021: Defense-Wide Electronic Procurement Capabilities-Contingency	94.033	7.970	7.108	6.949	-	6.949	7.034	7.186	7.341	7.304	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Defense-wide Electronic Procurement Capabilities provides for the development of critical e-business enterprise-wide requirements for the procurement community. These requirements may result from statute, regulation, process re-engineering or internal control requirements. This program provides opportunities for the introduction of innovative, time-saving, and cost-saving technologies into procurement processes across the Department. Resources are provided to conduct agile software development and testing on new or modified defense-wide e-business applications to ensure system and application development, integration, and demonstration of production representative systems and capabilities.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Defense-Wide Electronic Procurement Capabilities- Contingency	7.970	7.108	6.949
Description: FY 2021 Accomplishments: 1) Improved DoD's Joint Appointment Module (JAM) for management of Contracting Officer Representative (COR) and the Government Purchase Card (GPC) appointments to provide (1) complete access for CORs and DCAA auditors to share data on cost contracts, and (2) capturing office identification to facilitate more accurate FPDS reporting when GPC cardholders buy through FedMall. 2) Enhanced the Government Furnished Property (GFP) Module improving data reporting and aggregation across the process to better track serially managed items end-to-end. The GFP module was also enhanced to allow users to leverage spreadsheets to generate shipments and receipts as a way to improve adoption and usability. 3) Developed the first versions of the Catalog data standard whereby vendors can communicate their catalog offerings with DoD in a standard, repeatable method 4) Created a new feature within Electronic Data Access (EDA) to capture vendor's commercial catalogs as data and share with DoD users through both a web lookup feature and through system to system connections. 5) Significantly improved the Procurement Integrated Enterprise Environment (PIEE) access controls generating a single account management layer and common business rules across the five business areas that utilize PIEE while also revamping the user hierarchy to comply with federal reporting requirements.			
FY 2022 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605210D8Z / <i>Defense-Wide Electronic Procurement Capabilities</i>	Project (Number/Name) 021 / <i>Defense-Wide Electronic Procurement Capabilities- Contingency</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>FY 2022 plans continue to focus on improving the identification and tracking of government furnished property and resolving audit findings. DPC will also focus on continued implementation of the purchase request, procurement, and catalog data standards. Additional standard development will focus on other transactions. Further develop the modules in the Procurement Integrated Enterprise Environment (PIEE) to use the catalog data standard to drive better product and pricing identification. Continue to enhance supply chain risk data mining. Leverage robotics and automation efforts for streamlining procurement processes and expanding data mining. Develop enterprise requirements coming from emerging statutes and regulations for the fourth estate contract writing capability.</p> <p><i>FY 2023 Plans:</i></p> <p>FY 2023 plans continue to focus on improving the identification and tracking of government furnished property and resolving audit findings – completing key new capabilities in the Procurement Integrated Enterprise Environment (PIEE) to support. DPC will also focus on continued development of the catalog data standard to enable better price comparisons. Additional standard development will focus on implementation of procurement and purchase request data standards, particularly to major weapon system and spares contracting environments. Further develop the modules in PIEE to use the catalog data standard to drive better product and pricing identification; as well as better integrate the clause logic service (CLS) and former DCMA capabilities. Continue to enhance supply chain risk data mining and data collection capabilities in the Supplier Performance Risk System (SPRS) supporting statutory requirements. Leverage robotics and automation efforts for streamlining procurement processes and expanding data mining. Develop enterprise requirements coming from emerging statutes and regulations for the fourth estate contract writing capability.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i></p> <p>There is no significant change between FY 2022 and FY 2023.</p>			
Accomplishments/Planned Programs Subtotals		7.970	7.108
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0605210D8Z / <i>Defense-Wide Electronic Procurement Capabilities</i>						Project (Number/Name) 021 / <i>Defense-Wide Electronic Procurement Capabilities- Contingency</i>			
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contract Business Systems Development	Various	DLA, JTIC, WPAFB : FORT BELVOIR, SCOTT AFB	89.754	7.970		7.108		6.949		-		6.949	-	-	-
Subtotal			89.754	7.970		7.108		6.949		-		6.949	-	-	N/A
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Interoperability Testing	Various	DLA, JTIC, WPAFB : FORT BELVOIR, SCOTT AFB	4.279	-		-		-		-		-	-	-	-
Subtotal			4.279	-		-		-		-		-	-	-	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			94.033	7.970		7.108		6.949		-		6.949	-	-	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605210D8Z / Defense-Wide Electronic Procurement Capabilities	Project (Number/Name) 021 / Defense-Wide Electronic Procurement Capabilities- Contingency	

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Enhancements managed outside of DPC																												
Enhancements managed outside of DPC																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605210D8Z / Defense-Wide Electronic Procurement Capabilities	Project (Number/Name) 021 / Defense-Wide Electronic Procurement Capabilities- Contingency	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Enhancements managed outside of DPC				
Enhancements managed outside of DPC	4	2022	3	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 5: System Development & Demonstration (SDD)</i>	PE 0605294D8Z / <i>Trusted and Assured Microelectronics</i>											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	324.982	104.180	113.536	302.963	0.000	302.963	302.818	224.663	218.064	188.517	Continuing	Continuing
902: <i>Access to State-of-the-Art (SOTA) Microelectronics - Demonstration</i>	324.982	39.479	51.017	200.061	0.000	200.061	199.252	147.842	143.486	124.048	Continuing	Continuing
903: <i>Access to Advanced Packaging and Testing - Demonstration</i>	0.000	39.040	41.784	76.149	0.000	76.149	44.142	32.759	31.838	27.521	Continuing	Continuing
905: <i>Address DoD Unique Needs Radiation Hardening and non-CMOS - Demonstration</i>	0.000	25.661	20.735	26.753	0.000	26.753	59.424	44.062	42.740	36.948	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Build Sustainable and Long-Term Advantage, Defend the Homeland, and Deter Aggression.

This program supports microelectronics modernization activities that enable defense systems to keep pace with commercial microelectronics technological advances, reduce reliance on obsolete microelectronics, and mitigate the Department's reliance on sole source foundries for assured state-of-the-art (SOTA) microelectronics. It addresses the challenges of 1) having enduring access to a multiplicity of modern manufacturing processes that require commercial volumes to maintain long term viability and 2) protecting the intellectual property (IP) of the microelectronic parts that are manufactured.

This program supports the National Defense Strategy (NDS) for 2018's line of effort to build a more lethal force through modernization of key capabilities, the NDS defense objective of establishing an unmatched twenty-first century National Security Innovation Base that effectively supports Department operations and sustains security and solvency, and the NDS strategic approach of reforming the Department's business practices by simultaneously increasing performance and affordability while still minimizing risk.

This Program Element supports the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) Microelectronics Modernization Roadmap. The primary areas of focus of this roadmap include the following: access to state-of-the-art (SOTA) microelectronics technology, access to advanced packaging and test; quantifiable assurance and secure design; foundry access; verification and validation; policies, standards, and Joint Federated Assurance Center (JFAC) governing body; access to radiation hardened microelectronics; access to non-complementary metal oxide semiconductor (CMOS) SOTA microelectronics for radio frequency

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605294D8Z I <i>Trusted and Assured Microelectronics</i>
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and optoelectronic applications; disruptive research and development; education and workforce development; trusted foundry and obsolescence; and supply chain awareness and security.

Recognizing that an assured supply of microelectronics is a U.S. Government-wide concern, this activity will interface with interagency partners to take into account interagency requirements, opportunities for collaboration, and strategic decisions that can be made to limit the overall cost of these requirements to the USG.

This activity is being led by the Under Secretary of Defense for Research and Engineering.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	104.180	113.895	0.000	0.000	0.000
Current President's Budget	104.180	113.536	302.963	0.000	302.963
Total Adjustments	0.000	-0.359	302.963	0.000	302.963
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	0.000	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• FFRDC	-	-0.359	-	-	-
• Adjustments to Budget Year	-	-	90.623	-	90.623
• Economic Assumption	-	-	3.239	-	3.239
• Microelectronics Ecosystem	-	-	226.850	-	226.850
• Other Adjustment	-	-	-17.749	-	-17.749

Change Summary Explanation

In FY 2021, Program Element (PE) funding was re-aligned under three new project codes to correctly align Program Element (PE) funding in support of a Quantifiable Assurance philosophy and reflective of current priorities. The new project codes are: (1) Project Code 902 Access to State-of-the-Art (SOTA) Microelectronics - Demonstration; (2) Project Code 903 Access to Advanced Packaging and Testing - Demonstration; and (3) Project Code 905 Address DoD Unique Needs - Radiation Hardening and non-CMOS - Demonstration.

A Congressional rescission of \$8.216 million was enacted as part of the FY 2022 Appropriation reducing the available FY 2021 budget to \$95.964 million.

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

The FY 2023 funding request was reduced by -\$17.749 million to account for the availability of prior year execution balances.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0605294D8Z / <i>Trusted and Assured Microelectronics</i>				Project (Number/Name) 902 / <i>Access to State-of-the-Art (SOTA) Microelectronics - Demonstration</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
902: <i>Access to State-of-the-Art (SOTA) Microelectronics - Demonstration</i>	324.982	39.479	51.017	200.061	0.000	200.061	199.252	147.842	143.486	124.048	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project establishes multiple strategic partnerships with existing commercial state-of-the-art (SOTA) domestic foundries to develop a data-driven, risk-based approach to supply chain protection and demonstrate the assured manufacture of advanced electronic components.

Successful implementation will transition these technologies to use in DoD programs, obtain access to multiple commercial microelectronics facilities, establish secure design capabilities, and solidify a data-driven approach to supply chain protection. It also includes keeping pace with the rapid advancements in microelectronics technology and the globalization of this industry sector. It will provide the basics for updating and strengthening the DoD assurance policy and includes collaborating with industry to develop data driven quantifiable standards.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Design	16.000	0.000	-
<p>Description: This enhancement will demonstrate quantifiably assured design concepts in manufactured systems, enabling a formal risk-based approach to protection techniques. Manufactured microelectronics will be tested to ensure that IP protections meet or exceed current National Security Agency (NSA) standards for intellectual property (IP) protection, and to demonstrate the DoD's ability to detect certain malicious supply chain attacks on DoD microelectronics.</p> <p>This enhancement will also demonstrate a new data driven quantifiable assurance paradigm for supply chain protection. It will strengthen security while improving access, exposing no sensitive IP to the foundry and requiring post-manufacture validation of foundry products. This enhancement will demonstrate quantifiably assured design concepts in manufactured systems, enabling a formal risk-based approach to protection techniques. Manufactured microelectronics will be tested to ensure that IP protections meet or exceed current NSA standards for IP protection, and to demonstrate the DoD's ability to detect certain malicious supply chain attacks on DoD microelectronics.</p> <p>Successful implementation will transition these technologies to use in DoD programs, obtain access to multiple commercial microelectronics facilities, and solidify a data-driven approach to supply chain protection, including keeping pace with the rapid advancements in microelectronics technology and the globalization of this industry sector. It will provide the basics for updating and strengthening the DoD assurance policy and includes collaborating with industry to employ data driven quantifiable standards.</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 5		R-1 Program Element (Number/Name) PE 0605294D8Z / Trusted and Assured Microelectronics	Project (Number/Name) 902 / Access to State-of-the-Art (SOTA) Microelectronics - Demonstration		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
FY 2022 Plans: These efforts are being merged into a combined program for both secure design and quantifiable assurance activities beginning with FY 2022. See “Secure Design and Quantifiable Assurance Demonstration” program below.					
FY 2022 to FY 2023 Increase/Decrease Statement: These efforts are being merged into a combined program for both secure design and quantifiable assurance activities beginning with FY 2022. See “Secure Design and Quantifiable Assurance Demonstration” program below.					
Title: Foundry			3.834	4.000	13.000
Description: This activity implements multiple foundries process design kit (PDK) environments ensuring the government is not dependent on one single source for critical components. Demonstrate hardware through dedicated and multi-project wafer runs at multiple foundries.					
Commercial foundries generate enormous amounts of data on their processes as a best practice for quality assurance to improve reliability and increase yield. The Foundry program collects and utilizes this data to generate and allow quantitative comparison of performance and security metrics in the design and test stage of the microelectronics lifecycle, thereby mitigating risk.					
FY 2022 Plans: Planned activities are as follows: <ul style="list-style-type: none">Continued build-out of secured design environments and persistent expertise.Conduct additional domestic SOTA fabrication demonstrations.					
FY 2023 Plans: Planned activities are as follows: <ul style="list-style-type: none">Continue to enhance access to SOTA fabrication ecosystem.Maintain program of record access to assured fabrication flow and fund multi-project wafer production runs at multiple SOTA domestic sources.					
FY 2022 to FY 2023 Increase/Decrease Statement: Changes reflect a rebalancing of funding between this project and PE 0604294D8Z, Trusted and Assured Microelectronics (Budget Activity 4), Project 907: “Access to State-of-the-Art (SOTA) Microelectronics – Development.” This increase will broaden and accelerate access to semiconductor foundries by enabling; <ul style="list-style-type: none">Access to foundry data for accelerating the implementation of quantifiable assurance.					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 5		R-1 Program Element (Number/Name) PE 0605294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 902 / <i>Access to State-of-the-Art (SOTA) Microelectronics - Demonstration</i>		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> • Access to foundry subject matter experts on foundry process design kits (PDK) by the proto-type design teams. This enables more rapid design schedules, lowers risk and raises the level of expertise amongst the DIB design teams and the government verification and validations teams. • Enables continues access to multi-project wafer (MPW) across the DoD programs and DIB. One a result of the chips shortage is increase costs of foundry production, including MPW runs. 					
Title: Secure Design and Quantifiable Assurance Demonstration Description: This activity includes verifying the ability to fabricate classified and/or export-controlled designs in on-shore commercial foundries. Funding will establish multiple strategic partnerships with existing commercial domestic microelectronics design vendors and foundries to develop a data-driven, risk-based approach to supply chain protection and demonstrate the assured manufacture of advanced electronic components. <p>This project demonstrates the technical means for protecting IP and obfuscating the final user function from the supply chain will be realized using personalization, programmability and software, following application specific integrated circuit (ASIC) manufacturing. Efforts are on-going to update International Traffic in Arms Regulations (ITAR) and Export Administration Regulations (EAR) policy in this area. Funding supports activities to enhance the export control regime so that it maintains or strengthens current protections while enabling access to commercial capabilities, products, and IP.</p> <p>FY 2022 Plans: Planned activities are as follows:</p> <ul style="list-style-type: none"> • Enhance repositories with commercial and DoD relevant design IP for multi-foundry access • Continue to demonstrate enhanced secure design and cloud capability with new tools and techniques. • Continue to build-out secured design environments and persistent technical expertise • Enable enterprise licensing to tools and IP for rapid and scaled access to leading end technology. • Conduct enhanced IP demonstration and analysis of data driven risk assessments using independent verification and validation (V&V), data captures, intelligence reports, probability of detection and false alarm rates, and game theoretics. • Demonstrate rapid transition of DoD-relevant field programmable gate array-based capabilities to structured ASICs, with security capabilities to protect DoD intellectual property (IP) during manufacture. • Deploy integrated circuit deep inspection capability and conduct integrated circuit personalization demonstration. • Conduct additional foundry quantifiably assured fabrication demonstrations. <p>FY 2023 Plans: Planned activities are as follows:</p> <ul style="list-style-type: none"> • Continue to populate repositories with commercial and DoD relevant design IP for multi-foundry access • Continue to demonstrate enhanced secure design and cloud capability with new tools and techniques. 			19.645	47.017	37.161

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022	
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 902 / <i>Access to State-of-the-Art (SOTA) Microelectronics - Demonstration</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none">• Continue to build-out secured design environments and persistent technical expertise• Enable enterprise licensing to tools and IP for rapid and scaled access to leading end technology.• Conduct enhanced IP demonstration and analysis of data driven risk assessments using independent verification and validation (V&V), data captures, intelligence reports, probability of detection and false alarm rates, and game theoretics.• Demonstrate rapid transition of DoD-relevant field programmable gate array-based capabilities to structured ASICs, with security capabilities to protect DoD intellectual property (IP) during manufacture.• Deploy integrated circuit deep inspection capability and conduct integrated circuit personalization demonstration.• Conduct additional foundry quantifiably assured fabrication demonstrations. <p>FY 2022 to FY 2023 Increase/Decrease Statement: Changes reflect minor budget fluctuations.</p>				
<p>Title: Microelectronics Ecosystem</p> <p>Description: This enhancement to existing programs RAMP and RAMP-C enables the DoD and the defense industrial base to collaborate with the commercial microelectronics industry to increase proto-type development, demonstration, and address the war fighter’s need to maintain and modernize weapon systems as the threat landscape shifts. It enables the use of combined cyber-security methods/cryptography in the DoD hardware and utilization of complex computational capabilities in active electronically scanned array (AESA) phase array radar, electronic warfare (EW), and in secure communications, including 5G radio access network (RAN) systems. The department’s future deployment of large constellations of networked satellites requires the use of leading-edge semiconductor components to enable real time communication and computation as well as for other advanced DoD system microelectronics applications. In addition, space based and strategic weapon systems require more advanced radiation hardened microelectronics. Virtually all DoD next-generation technology transition programs demand assured access to advanced microelectronics technology and components. This modernization enhancement ensures the full realization of the T&AM program investments already made.</p> <p>FY 2023 Plans: Develop and demonstrate access to a leading edge, commercially-viable, domestic U.S.-located wafer foundry ecosystem capability, on the order of more than 26,000 wafer starts per month for design and manufacturing of quantifiably assured, dual-use commercial and DoD custom integrated circuits. A successful WILL enable the following:</p> <ul style="list-style-type: none">• Access to a SOTA U.S. wafer foundry• Access to commercial and critical quantifiably assured dual-use COTS integrated circuits• Access to capabilities necessary to develop and demonstrate quantifiably assured custom DoD integrated circuits• The jump-start in commercial use of the domestic foundry by key U.S. fabless companies• Establishment and demonstration of a viable design ecosystem including access to 3rd party design modules• The reduction in the cost differential of building a U.S.-located wafer foundry verses off-shore		-	-	149.900

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 902 / <i>Access to State-of-the-Art (SOTA) Microelectronics - Demonstration</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> • The enablement of commercially-supported and enduring U.S. logic foundry capability • Development of the DoD proto-type demonstrator designs with DIB to accelerate technology transition <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> This enhancement to existing programs RAMP and RAMP-C enables T&AM program to demonstrate by FY2023-2025 full access to U.S. commercial SOTA design, foundry, and advanced packaging capability and meet DoD's unique needs within two to three years for modernization, including for RH and photonics applications. The capability will reduce the time needed to replace microelectronics components that are generations behind the commercial sector, move away from off-shore sources for SOTA commercial integrated circuits, and accelerate the demonstration and adoption of quantifiable assurance methods throughout the microelectronics lifecycle and supply chain. Reducing the timeline by up to two years not only benefits export control and classified system protection, but also the requirements of the National Defense Autorotation Act Section 224 for FY 2020 for the DoD to implement commercial standards for the acquisition of assured microelectronics products by 2023.</p>			
Accomplishments/Planned Programs Subtotals		39.479	51.017
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
N/A			
D. Acquisition Strategy			
N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0605294D8Z / <i>Trusted and Assured Microelectronics</i>				Project (Number/Name) 902 / <i>Access to State-of-the-Art (SOTA) Microelectronics - Demonstration</i>					

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Access to State-of-the-Art (SOTA) Microelectronics - Demonstration	MIPR	Defense Advanced Research Projects Agency, Air Force, Army, Navy, National Security Agency : Various	324.982	39.479	Mar 2021	51.017	Mar 2022	200.061	Mar 2023	-		200.061	Continuing	Continuing	-
Subtotal			324.982	39.479		51.017		200.061		-		200.061	Continuing	Continuing	N/A

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	324.982	39.479		51.017		200.061	-		N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense										Date: April 2022	
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0605294D8Z / <i>Trusted and Assured Microelectronics</i>					Project (Number/Name) 902 / <i>Access to State-of-the-Art (SOTA) Microelectronics - Demonstration</i>	

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<i>Access to State-of-the-Art (SOTA) Microelectronics - Demonstration</i>																												
Third party intellectual property (IP) and electronic design automation (EDA) tool repository demonstration																												
New microelectronics demonstration, and capability insertion																												
Demonstrate assured access to multiple SOTA domestic fabrication sources.																												
Demonstrate access to multiple SOTA commercial foundry process design kit's (PDK's)																												
Management/Technical Support																												
Microelectronics Assurance and Supply Chain Standards and Best Practices Demonstration																												
U.S. Government and Industry Engagement for demonstration of data driven quantifiable assurance tools, techniques, and risk based metrics																												
ASIC netlist analysis capability demonstration																												
Field programmable gate array (FPGA) analyses tool demonstration																												
Assured design demonstration and evaluation																												
Government and industry engagement to demonstrate data driven quantifiable assurance																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 902 / <i>Access to State-of-the-Art (SOTA) Microelectronics - Demonstration</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Access to State-of-the-Art (SOTA) Microelectronics - Demonstration</i>				
Third party intellectual property (IP) and electronic design automation (EDA) tool repository demonstration	2	2021	4	2027
New microelectronics demonstration, and capability insertion	2	2021	4	2027
Demonstrate assured access to multiple SOTA domestic fabrication sources.	2	2021	4	2027
Demonstrate access to multiple SOTA commercial foundry process design kit's (PDK's)	2	2021	4	2027
Management/Technical Support	2	2021	4	2027
Microelectronics Assurance and Supply Chain Standards and Best Practices Demonstration	2	2021	4	2027
U.S. Government and Industry Engagement for demonstration of data driven quantifiable assurance tools, techniques, and risk based metrics	2	2021	4	2027
ASIC netlist analysis capability demonstration	2	2021	4	2027
Field programmable gate array (FPGA) analyses tool demonstration	2	2021	4	2027
Assured design demonstration and evaluation	2	2021	4	2027
Government and industry engagement to demonstrate data driven quantifiable assurance	2	2021	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0605294D8Z / Trusted and Assured Microelectronics				Project (Number/Name) 903 / Access to Advanced Packaging and Testing - Demonstration			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
903: Access to Advanced Packaging and Testing - Demonstration	0.000	39.040	41.784	76.149	0.000	76.149	44.142	32.759	31.838	27.521	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
This project will leverage existing commercially available expertise and capability to deliver self-sustaining digital and radio frequency (RF) state-of-the-art (SOTA) heterogeneous integrated packaging (SHIP), assembly, and test capability.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: Access to Advanced Packaging and Testing - Demonstration									39.040	41.784	19.199	
Description: This project will deliver an on-shore SHIP assembly and test capability. It will provide access to, personalization of, and customization for supporting the DoD programs. It will enable a revolutionary leap in system performance that will greatly reduce size, weight and power (SWaP) by incorporating the immense advances in SOTA commercial off the shelf (COTS) processing technologies, such as field programmable gate arrays (FPGAs), microprocessors, and Graphic Processing Units (GPUs).												
FY 2022 Plans: Planned activities are as follows: <ul style="list-style-type: none">Continue to demonstrate enhanced secure design and secure packaging with new tools and techniques.Continue demonstration of heterogeneous integration for secure packaging and test.Demonstrate prototype hardware and additional program-driven designs of increasing complexity and capability/performance.												
FY 2023 Plans: Planned activities are as follows: <ul style="list-style-type: none">Continue to demonstrate enhanced secure design and secure packaging with new tools and techniques.Continue demonstration of heterogeneous integration for secure packaging and test.Demonstrate prototype hardware and additional program-driven designs of increasing complexity and capability/performance.												
FY 2022 to FY 2023 Increase/Decrease Statement:												

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 5		R-1 Program Element (Number/Name) PE 0605294D8Z / <i>Trusted and Assured Microelectronics</i>		Project (Number/Name) 903 / <i>Access to Advanced Packaging and Testing - Demonstration</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Funding will decrease following the establishment of the initial advanced packaging and testing capability, which will continue to deliver proto-type designs and hardware for accelerating program adoption and for qualification, and further develop the infrastructure and process that supports ITAR/EAR, proprietary and security requirements.					
Title: Microelectronics Ecosystem Description: Leading-edge semiconductor design and manufacturing technology forms the basis for many of the DoD modernization priorities. This program enhancement enables secure the DoD access to leading-edge semiconductor technology through domestic U.S.-located sources of custom and dual-use leading edge integrated circuits utilizing heterogeneous integration and advanced packaging. This enables implementation of complex, computation intensive AI algorithms for DoD AI and Autonomy applications. It will also facilitate use of integrated cyber-security methods/cryptography in the DoD hardware and utilization of the complex computational capability required for Active Electronically Scanned Array (AESA) Phase Array Radar System and Electronic Warfare (EW) and communications including 5G Radio access network (RAN) systems. The proposed large constellations of networked satellites will also require leading-edge semiconductor components to enable real time communication and on-satellite computation. FY 2023 Plans: <ul style="list-style-type: none"> • Accelerate and expand the development of multi-chip packaging (MCP) proto-type demonstrators in collaboration with DoD Programs and the defense industrial for process intensive applications and RF such as ASEA Radar, cognitive EW and autonomy, while enhancing security for protecting IP and CPI. • Expand and accelerate demonstration of prototype hardware and additional program-driven designs of increasing complexity and capability/performance. <ul style="list-style-type: none"> o Layered approach for IP & CPI protection o Enhanced resistance to security and cyber threats o Customized personalization per Program or MCP o Risk reduction by much greater visibility into the supply chain and assembly process, including quantifiable data for material tracking, meteorology and process control FY 2022 to FY 2023 Increase/Decrease Statement: <p>Access to quantifiably assured dual-use COTS integrated circuits that are fabricated, assembled, tested and personalized in U.S.-located manufacturing facilities. Most dual-use COTS parts used for modernization priorities are currently manufactured in Asian facilities that do not provide measurable assurance. This situation is very unlikely to change without this enhancement. This increase will be use to accelerate and expand adoption & use in military systems to design, packaging, and assembly to shorten transition time to DoD programs. These proto-type could include the following features critical to DoD weapon system modernization and protection of intellectual property (IP):</p>			-	-	56.950

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 903 / <i>Access to Advanced Packaging and Testing - Demonstration</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> • Demonstrate DIB and DoD maturation leveraging commercial design using developed PDKs and ADKs to design custom devices. • Demonstrate DoD access to SOTA MCP products utilizing commercial packaging, assembly, and test and efficiencies gained in IP/design re-use to lower cost, risk and shorten schedules <ul style="list-style-type: none"> o Demonstrate the use of a catalog of designs, die, chiplets, package types, etc. o Ensure Reuse and Standardization for sustainability and costs. • All proto-type demonstrators shall implement microelectronics quantifiable assurance to ensure product integrity and ensure confidentiality of critical IP. 			
Accomplishments/Planned Programs Subtotals		39.040	41.784
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0605294D8Z / <i>Trusted and Assured Microelectronics</i>				Project (Number/Name) 903 / <i>Access to Advanced Packaging and Testing - Demonstration</i>					

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Access to Advanced Packaging and Testing - Demonstration	MIPR	Defense Advanced Research Projects Agency, Air Force, Army, Navy, National Security Agency : Various	-	39.040	Mar 2021	41.784	Mar 2022	76.149	Mar 2023	-		76.149	Continuing	Continuing	-
Subtotal			-	39.040		41.784		76.149		-		76.149	Continuing	Continuing	N/A

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	39.040	41.784	76.149	-	76.149	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 903 / <i>Access to Advanced Packaging and Testing - Demonstration</i>	

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<i>Access to Advanced Packaging and Testing - Demonstration</i>																												
Demonstrate specialized DoD chiplets in a heterogeneous integrated (HI) assembly																												
Demonstrate advanced microelectronics packaging and test capabilities																												
Demonstrate secure, accessible, and cost effective SOTA heterogeneous integration design, assembly and test capability																												
Demonstrate a SOTA prototype packaging secure assembly and test source for SOTA digital and RF applications.																												
Demonstrate reduced DoD program packaging size, weight and power requirements																												
Demonstrate packaging advances in SOTA commercial off the shelf (COTS) processing technologies																												
Management/Technical Support																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 903 / <i>Access to Advanced Packaging and Testing - Demonstration</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Access to Advanced Packaging and Testing - Demonstration</i>				
Demonstrate specialized DoD chiplets in a heterogeneous integrated (HI) assembly	2	2021	4	2027
Demonstrate advanced microelectronics packaging and test capabilities	2	2021	4	2027
Demonstrate secure, accessible, and cost effective SOTA heterogeneous integration design, assembly and test capability	2	2021	4	2027
Demonstrate a SOTA prototype packaging secure assembly and test source for SOTA digital and RF applications.	2	2021	4	2027
Demonstrate reduced DoD program packaging size, weight and power requirements	2	2021	4	2027
Demonstrate packaging advances in SOTA commercial off the shelf (COTS) processing technologies	2	2021	4	2027
Management/Technical Support	2	2021	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0605294D8Z / Trusted and Assured Microelectronics				Project (Number/Name) 905 / Address DoD Unique Needs Radiation Hardening and non-CMOS - Demonstration			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
905: Address DoD Unique Needs Radiation Hardening and non-CMOS - Demonstration	0.000	25.661	20.735	26.753	0.000	26.753	59.424	44.062	42.740	36.948	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project addresses the dual problems of commanding only a small market share while requiring an expansive range of unique microelectronics needs, from boutique and legacy components to state-of-the-art (SOTA) technologies. The Government must sustain specialty suppliers, given their criticality to national security. In particular, DoD needs access to a diverse microelectronics ecosystem to develop and acquire the application specific integrated circuit (ASICs) and personalized commercial off the shelf (COTS) components required for military radiation hardened and radio frequency and optical needs.

The Department frequently relies on commercial suppliers to optimize performance and reduce costs for sophisticated weapon system and secure network functionality. It is critical that the DoD has future access to subject matter expertise, technology, and manufacturing.

In addition to Rad Hard needs, the DoD requires access to RF and opto-electronic materials, foundries, and packaging facilities, in order to enable next generation sensors and communications. The DoD must leverage state-of-the-art microelectronic technologies driven by mega-trends such as 5G wireless and datacenters in order to combat emerging threats and provide overmatch technology to the warfighter. At the same time, the DoD must fill the gaps which are left unaddressed these dual-use mega-trends in order to satisfy mission requirements. By partnering in the maturation of state-of-the-art material sources, foundries, and packaging facilities, the DoD is able to tailor process development towards unique DoD interests and encourage open access design, which stimulates innovation and drives affordability. Additionally, critical investments must be made in the domestic supply chains supporting both RF Gallium Nitride (GaN) and integrated photonics in order to maintain the integrity and security of the Defense Industrial Base.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Address DoD Unique Needs - Radiation Hardening and non-CMOS - Demonstration	25.661	20.735	6.753
Description: Government-unique trusted design and manufacturing flows have been developed to enable a tier of trust for select ASIC parts; however, this approach addresses only a small subset of DoD microelectronics requirements (e.g., processors, memory, microcontrollers, field programmable gate arrays (FPGAs), and radiation-tolerant processors).			
The DoD will partner with the intelligence community, the Department of Energy, and the National Aeronautics and Space Administration to demonstrate radiation hardened components that permit systems to operate in space and other harsh environments. State-of-the-practice (SOTP) and SOTA technologies will be characterized and developed in support of Radiation			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 905 / <i>Address DoD Unique Needs Radiation Hardening and non-CMOS - Demonstration</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>Hardened By Process (RHBP) and Radiation Hardened By Design (RHBD) activities in support the DoD modernization programs with radiation hardened requirements.</p> <p>A similar situation exists for radio frequency and optical applications. These two applications reflect only a small market with unique costs and specifications, which does not inherently create incentive for industrial investment.</p> <p>Within RF and opto-electronics, investments will be made in RF GaN and integrated photonic material sources, foundries, and packaging facilities in order to enable low-size, weight, and power devices which broadly access the millimeter wave spectrum, while providing high-bandwidth data transmission.</p> <p>FY 2022 Plans: Planned activities are as follows:</p> <ul style="list-style-type: none"> • Continue to demonstrate SOTP and SOTA technologies utilizing RHBP and RHBD activities in support of DoD modernization programs with radiation hardened requirements. • Transition developed RH technologies into space and strategic programs. • Qualify large-diameter Nitrogen-Polar RF GaN material source and mature off-axis Silicon Carbide substrate. • Baseline at MRL-4 and mature towards MRL-6 multiple state-of-the-art RF GaN foundries offering open access to millimeter wave device design and advanced interconnect services. • Perform an industrial base assessment of the integrated photonics foundry ecosystem and generate actionable guidance for foundry maturation by the DoD. • Demonstrate access to state-of-the-art RF GaN and integrated photonic foundries via advanced prototype demonstrators. <p>FY 2023 Plans: Planned activities are as follows:</p> <ul style="list-style-type: none"> • Continue to demonstrate SOTP and SOTA technologies utilizing RHBP and RHBD activities in support of DoD modernization programs with radiation hardened requirements. • Transition developed RH technologies into space and strategic programs. • Continue to mature large-diameter Nitrogen-Polar RF GaN material source and off-axis Silicon Carbide substrate. Foundries will assess epiwafers and provide feedback critical to baselining the N-Polar recipe. • Continue to mature towards MRL-6 multiple state-of-the-art RF GaN foundries offering open access to millimeter wave device design and advanced interconnect services. • Act upon industrial base assessment of the integrated photonics foundry ecosystem and mature strategic components of the domestic integrated photonics supply chain. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 905 / <i>Address DoD Unique Needs Radiation Hardening and non-CMOS - Demonstration</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> Demonstrate access to state-of-the-art RF GaN and integrated photonic foundries via advanced prototype demonstrators. <p>FY 2022 to FY 2023 Increase/Decrease Statement: Changes reflect a rebalancing of funding between this project and PE 0604294D8Z, Trusted and Assured Microelectronics (Budget Activity 4), Project 911: "Address DoD Unique Needs - Radiation Hardening and non-CMOS - Development."</p> <p>Title: Microelectronics Ecosystem</p> <p>Description: The DoD requires access to Radiation Hardened (Rad Hard), radio frequency (RF), and opto-electronics (OE) that requires additional investment to accelerate and expand demonstrate product design techniques and material maturation in next generation SOTA technology nodes.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> Establish the first domestic production source of Nitrogen-Polar Gallium Nitride (GaN) material, and demonstrate production of mmW devices with maximum RF power and efficiency. Demonstrate design and process capability with radiation hard by design tested chip, TRL-6Two new sources of radiation hard by design enabling onboard processing capability with 100x capability improvement. Establish a mature portfolio of domestic RF GaN foundries, which offers open access to millimeter wave technology and product transition via the DoD Advanced Packaging ecosystem. Demonstrate advanced integrated photonics prototypes via secure access to state-of-the-art domestic foundries. <p>FY 2022 to FY 2023 Increase/Decrease Statement: Strategic and space radiation-hardened microelectronics, and are critical in support of ongoing and future nuclear modernization and sustainment programs. This funding eliminates gaps in research and development (R&D), domestic capability, memory technologies, and test and evaluation infrastructure to alleviate the significant nuclear modernization and sustainment program risks. Additionally, RF and opto-electronic investments Accelerates secure access to state of the art RF GaN and Silicon Photonic materials, foundries, and packaging facilities, which enables next generation sensors and communications. Demonstrate State -of -the -art prototypes and IP demonstrate low-size, weight, and power millimeter wave access and high-bandwidth data transmission for, which transition to DoD programs and the Defense Industrial Base.</p>			
		-	-
			20.000
Accomplishments/Planned Programs Subtotals		25.661	20.735
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 905 / <i>Address DoD Unique Needs Radiation Hardening and non-CMOS - Demonstration</i>
D. Acquisition Strategy N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0605294D8Z I Trusted and Assured Microelectronics				Project (Number/Name) 905 I Address DoD Unique Needs Radiation Hardening and non-CMOS - Demonstration					
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Address DoD Unique Needs - Demonstration	MIPR	Defense Advanced Research Projects Agency, Air Force, Army, Navy, National Security Agency : Various	-	25.661	Mar 2021	20.735	Mar 2022	26.753	Mar 2023	-		26.753	Continuing	Continuing	-
Subtotal			-	25.661		20.735		26.753		-		26.753	Continuing	Continuing	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	25.661		20.735		26.753		-		26.753	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 905 / <i>Address DoD Unique Needs Radiation Hardening and non-CMOS - Demonstration</i>	

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<i>Address DoD Unique Needs - Radiation Hardening and non-CMOS - Demonstration</i>																												
Radiation hardening by process and radiation hardening by design demonstration activities																												
Qualify new SOTA and SOTP sources for RH electronics to demonstrate radiation hardened capabilities																												
Establish 2nd source for strategic radiation hardened by process (RHBP) state-of-the-practice (SOTP) partially depleted silicon on insulator source																												
Establish, qualify, and demonstrate advanced material sources and device process for RF and opto-electronics																												
Access, mature, and assure state-of-the-art foundry and packaging processes for monolithic microwave integrated circuits (MMICs) and photonic integrated circuits (PICs)																												
Demonstrate state-of-the-art RF and opto-electronic prototypes and IP for transition into the DoD advanced packaging ecosystem																												
Management/Technical Support																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605294D8Z / <i>Trusted and Assured Microelectronics</i>	Project (Number/Name) 905 / <i>Address DoD Unique Needs Radiation Hardening and non-CMOS - Demonstration</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Address DoD Unique Needs - Radiation Hardening and non-CMOS - Demonstration</i>				
Radiation hardening by process and radiation hardening by design demonstration activities	2	2021	4	2027
Qualify new SOTA and SOTP sources for RH electronics to demonstrate radiation hardened capabilities	2	2021	4	2027
Establish 2nd source for strategic radiation hardened by process (RHBP) state-of-the-practice (SOTP) partially depleted silicon on insulator source	2	2021	4	2027
Establish, qualify, and demonstrate advanced material sources and device process for RF and opto-electronics	2	2021	4	2027
Access, mature, and assure state-of-the-art foundry and packaging processes for monolithic microwave integrated circuits (MMICs) and photonic integrated circuits (PICs)	2	2021	4	2027
Demonstrate state-of-the-art RF and opto-electronic prototypes and IP for transition into the DoD advanced packaging ecosystem	2	2021	4	2027
Management/Technical Support	2	2021	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 5: System Development & Demonstration (SDD)</i>	PE 0605772D8Z I <i>Nuclear Command Control and Communications (NC3)</i>											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	0.000	3.547	3.969	3.758	-	3.758	3.853	3.808	3.795	3.776	Continuing	Continuing
815: <i>Nuclear Command, Control and Communications (NC3)</i>	0.000	3.547	3.969	3.758	-	3.758	3.853	3.808	3.795	3.776	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Defend the Homeland, Provide Nuclear Deterrence, and Build Sustainable and Long-Term Advantage.

This program supports the Under Secretary of Defense for Acquisition and Sustainment roles as Principal Staff Assistant (PSA) for NC3 and NC3 Capability Portfolio Manager (CPM) as directed by the Secretary of Defense in the NC3 Governance Improvement (NGI) Implementation Plan. The NC3 Portfolio consists of ~200 systems, platforms, networks, and applications. The goals of the CPM are to 1) assess NC3 modernization programs and their integration, synchronization, and contribution to the NC3 enterprise, 2) monitor the readiness of operational NC3 systems, 3) identify performance gaps and make recommendations on technology upgrades and prototyping to enable the future capabilities to outpace the threat, and 4) support data-driven portfolio management by developing the necessary tools and processes to assess and manage integrated programmatic and technical risks. These tools include software, analytical expertise, and information storage and retrieval systems to support the continuing development of CPM for managing the complex NC3 enterprise. These efforts will simultaneously support the Commander, U.S. Strategic Command (USSTRATCOM) as NC3 Enterprise Lead; NC3 Enterprise Center (NEC); systems engineering and architecture development entities; the Under Secretary of Defense (USD) for Research and Engineering (R&E), the Joint Staff, and the Services. This program supports the capability portfolio-based approach (DoD Directive 7045.02, "Capability Portfolio Management").

This program funds development of new tools, technical assessments, and planning for the CPM to manage the NC3 enterprise. This includes:

- 1) developing and deploying software tools for improving NC3 enterprise-level management and programmatic and technical risk assessments;
- 2) supporting the office of primary responsibility for NC3 enterprise capability portfolio management (to include assessing current capability, complying with statutory mandates, and conducting NC3-related studies, analyses, and policy updates);
- 3) assessing DoD Component plans, programs, and budgets for adequacy and execution (including courses of action development and recommendations);
- 4) identifying, prototyping, evaluating, and recommending new technology for inclusion in the NC3 system; and
- 5) developing NC3 corrective action and risk mitigation plans to support the NC3 CPM investment recommendations to senior DoD leadership.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605772D8Z I <i>Nuclear Command Control and Communications (NC3)</i>
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B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	3.683	3.991	0.000	-	0.000
Current President's Budget	3.547	3.969	3.758	-	3.758
Total Adjustments	-0.136	-0.022	3.758	-	3.758
• Congressional General Reductions	-	-0.022			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.136	-			
• Adjustments to Budget Year	-	-	3.758	-	3.758

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0605772D8Z / Nuclear Command Control and Communications (NC3)				Project (Number/Name) 815 / Nuclear Command, Control and Communications (NC3)			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
815: Nuclear Command, Control and Communications (NC3)	0.000	3.547	3.969	3.758	-	3.758	3.853	3.808	3.795	3.776	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program supports development and operation of analytical tools to evaluate authoritative data (cost, schedule, performance, risk) on NC3 Portfolio programs to maximize portfolio alignment to strategic priorities and capabilities. It will create integrated development and delivery schedules for NC3 programs. These tools will forecast system/capability degradation as well as plans for capability replacement, improvement, or replacement in the context of the larger NC3 enterprise. It also provides the technical expertise to support risk management analysis (with an emphasis on system design, development and acquisition) of the NC3 enterprise and will develop strategies for synchronizing NC3 preplanned improvements. It will support the timely exchange of program and capability status information between elements of the NC3 enterprise, the OSD staff, and the combatant commands with a goal of increasing the use of electronic means to provide current and accurate information on key elements of the NC3 enterprise.

The effort will develop robust, integrated capability plans and schedules for NC3 capabilities to clarify system dependencies and identify disconnects. It will also support cross-department collaboration for development of enterprise-wide approaches for capability management. This includes: (1) vertical and horizontal integration activities within the Department and with the interagency where appropriate; (2) a coordinated portfolio-based approach to planning, programming, budgeting and execution; (3) reform efforts at the legislative, governance, policy, management and execution levels; 4) protection of information and technology that support or enables technology-based capability development for the NC3 warfighting domain and 5) supports the identification, evaluation, and incorporation of promising technology for inclusion in the NC3 system.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Nuclear Command, Control and Communications (NC3)	3.547	3.969	3.758
Description: FY 2021 Accomplishments: Supported NC3 governance processes to include semiannual Deputy Secretary of Defense chaired NC3 Enterprise Reviews, Secretary of Defense (SecDef) Weekly Priority Review, and multiple Systems Engineering and Authorities Board with detailed programmatic cost, schedule, and performance analysis for senior executive decisions on resource allocations and strategic direction. Established process and conducted quarterly analysis of 36 NC3 Portfolio modernization programs and identified programmatic risk (cost, schedule, and performance) challenges and developed strategies to correct deficiencies and maintain critical path.			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 5		R-1 Program Element (Number/Name) PE 0605772D8Z I Nuclear Command Control and Communications (NC3)	Project (Number/Name) 815 I Nuclear Command, Control and Communications (NC3)		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>Conducted root cause analysis of schedule slippages of NC3 Portfolio development programs in response to NC3 Enterprise Lead tasking aimed at reducing operational risk by allowing timely retiring of vintage systems with more resilient modernization programs.</p> <p>FY 2022 Plans: Support the NC3 governance process by providing analysis and recommendations to the NC3 CPM for presentation to senior leadership bodies (NC3 Enterprise Review, Deputy's Management Action Group, SecDef Nuclear Transition Review, etc.).</p> <p>Support programmatic (cost, schedule, and performance) analysis on the NC3 portfolio of programs, systems, and facilities. Work collaboratively with the NC3 Enterprise Center (NEC), Services, and DoD Agencies to develop strategies to correct deficiencies and speed modernization.</p> <p>Evaluate, make recommendations, and support NC3 CPM interaction with Congress.</p> <p>Work with the Under Secretary of Defense Research and Engineering to develop Science and Technology Strategic Plans to develop next generation NC3 capabilities and to ensure a viable path exists to transition technology to new or existing acquisition programs.</p> <p>Review Commander, U.S. Strategic Command's NC3 Capability Planning Guidance and support the NC3 CPM in tracking Component compliance.</p> <p>Continue development of analytic tools, automated processes, and dashboards that allow data access and monitoring of the NC3 enterprise to identify programmatic issues early and implement corrective action.</p> <p>FY 2023 Plans: Conduct analysis and support the semiannual NC3 Enterprise Reviews with the Deputy Secretary of Defense (DepSecDef) and Vice Chairman of the Joint Chiefs of Staff , SecDef Nuclear Transition Review, the Systems Engineering and Authorities (SEA) Board, Integrated Acquisition Portfolio Reviews, and other Senior Leader NC3 meetings.</p> <p>Support programmatic (cost, schedule, and performance) analysis on the NC3 portfolio of programs, systems, and facilities. Work collaboratively with the NC3 Enterprise Center (NEC), Services, and DoD Agencies to develop strategies to correct deficiencies and speed modernization.</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605772D8Z / Nuclear Command Control and Communications (NC3)	Project (Number/Name) 815 / Nuclear Command, Control and Communications (NC3)	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
Coordinate on the USSTRATCOM FY 2025 to FY 2029 NC3 Capability Planning Guidance (CPG), draft program review recommendations on NC3 high risk programs, and initiate POM23 issue artifacts in support of program and budget review efforts to align NC3 investment. FY 2022 to FY 2023 Increase/Decrease Statement: Decrease from FY 2022 to FY 2023 is the result of defense wide leadership reductions.			
Accomplishments/Planned Programs Subtotals		3.547	3.969
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
Utilize existing fixed-price and cost-plus contracts (where appropriate) to continue implementation of NC3 Capability Portfolio Management, provide technical expertise for NC3 system evaluation and strategic planning, and development of NC3 analytical tools.			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0605772D8Z / Nuclear Command Control and Communications (NC3)						Project (Number/Name) 815 / Nuclear Command, Control and Communications (NC3)			
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
NC3 Capability Portfolio Management	C/CPFF	OUSD(A&S)/ OASD(A)/ DASD(I&IPM): Pentagon : OUSD(A&S)/ OASD(A)/ DASD(I&IPM): Pentagon	-	3.547	Jan 2021	3.969		3.758	Jan 2023	-		3.758	Continuing	Continuing	-
Subtotal			-	3.547		3.969		3.758		-		3.758	Continuing	Continuing	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	3.547		3.969		3.758		-		3.758	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity						R-1 Program Element (Number/Name)						Project (Number/Name)			
0400 / 5						PE 0605772D8Z / Nuclear Command Control and Communications (NC3)						815 / Nuclear Command, Control and Communications (NC3)			

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Nuclear Command, Control and Communications (NC3)																												
Software Support Contract Awards																												
Systems Engineering & Technical Support Contract Awards																												
OUSD(A&S) Capability Portfolio Management																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605772D8Z / <i>Nuclear Command Control and Communications (NC3)</i>	Project (Number/Name) 815 / <i>Nuclear Command, Control and Communications (NC3)</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Nuclear Command, Control and Communications (NC3)</i>				
Software Support Contract Awards	2	2021	4	2022
Systems Engineering & Technical Support Contract Awards	2	2021	4	2022
OUSD(A&S) Capability Portfolio Management	1	2021	4	2021

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 5: System Development & Demonstration (SDD)</i>	PE 0305304D8Z / <i>Real Property Information Management</i>											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	18.455	3.152	2.214	8.121	-	8.121	7.868	7.386	7.374	7.370	-	-
305: <i>RP Information Management</i>	16.215	0.816	1.878	7.461	-	7.461	7.249	6.844	6.834	6.830	-	-
306: <i>DoD Application</i>	2.035	0.000	0.336	0.000	-	0.000	0.000	0.000	0.000	0.000	-	-
307: <i>RP Clearinghouse</i>	0.205	2.336	0.000	0.660	-	0.660	0.619	0.542	0.540	0.540	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiative to Build Sustainable and Long-Term Advantage.

Established in FY 2013, and tasked with supporting the Department's goals for audit readiness, energy efficiency, Real Property accountability, and to improve data quality and integration across the full spectrum of Sustainment business functions. DoD Real Property Information Management is used to maintain accurate and accessible data for all DoD real property assets. To manage this information we must conduct Business Process Re-engineering activities, developing and publishing data standards. Funding is also used to support the Assistant Secretary of Defense (ASD) Sustainment Senior Real Property Officer accountability requirements, such as, reconciliation of enterprise real property inventory records and development of asset management processes, business rules and associated data standards. A major component of this effort is fielding an enterprise Data Analytics and Integration Support (DAIS) platform coupled with an independent verification and validation capability, providing access to real time data through Web Services Description Language (WSDL) in support of timely, data-driven decision-making. The DAIS Portal also hosts a build out of data stores and portal requirements for Energy Resiliency and Conservation Investment Program (ERCIP) management as well as, the Construction Management Portal. A funding line was added to manage the RDT&E funding for the DoD Siting Clearinghouse. The program was stood up as a congressional requirement. This program is charged by statute to identify technical mitigation measures necessary to overcome degradation of radar from the proliferation of industrial wind turbine development. This research and development is necessary to work with Federally Funded Research and Development Centers (FFRDCs) to study potential technical improvements to radar.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0305304D8Z I <i>Real Property Information Management</i>
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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	3.273	2.227	0.000	-	0.000
Current President's Budget	3.152	2.214	8.121	-	8.121
Total Adjustments	-0.121	-0.013	8.121	-	8.121
• Congressional General Reductions	-	-0.013			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.121	-			
• Adjustments to Budget Year	-	-	8.121	-	8.121

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0305304D8Z / Real Property Information Management				Project (Number/Name) 305 / RP Information Management			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
305: RP Information Management	16.215	0.816	1.878	7.461	-	7.461	7.249	6.844	6.834	6.830	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The Real Property Inventory fulfills requirements of Executive Orders to achieve and maintain real property accountability and is a key component supporting both audit readiness and life-cycle asset management activities. This funding provides the department independent verification and validation needed to reconcile data errors, promoting improved data quality, and facilitating interoperability with Service systems to provide an enterprise view of asset management across the real property lifecycle from acquisition to disposal. Oversight and configuration management of business rules and standards are used to determine requirements, manage inventory records, and improve business processes. This initiative includes development and procurement of the enterprise data warehouse for integrating existing and future Sustainment systems and database needs. The required Real Property Unique Identifier (RPUID) process is included in this enterprise system.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: Real Property Accountability									0.816	1.878	7.461	
Description: The ASD Sustainment is the Senior Real Property Officer for the DoD, responsible for accountability and utilization of all DoD Real Property Assets. This funding provides the department an enterprise data warehouse coupled with an independent verification and validation capability. The DoD Real Property Accountability efforts are mandated by Executive Order and Public Law for improved reporting and utilization of federal real property, and to support data-driven decisions.												
FY 2022 Plans: Continue to support reconciliation and audit corrective action plan efforts by identifying errors/inconsistencies in Real Property inventory records, asset accountability and management processes, and business rules and associated data. Continue Data Analytics and Integration Support (DAIS) platform and Web Services Description Language (WSDL) implementation to improve data quality supporting multiple analyses.												
FY 2023 Plans: Continue to support reconciliation and audit corrective action plan efforts by identifying errors/inconsistencies in Real Property inventory records, asset accountability and management processes, and business rules and associated data. Bring Data Analytics and Integration Support (DAIS) platform and Web Services Description Language (WSDL) implementation to IOC and complete links to ADVANA. Ensure improved data quality supporting multiple analyses and provide quality management mechanism for all of the DoD Real Property information.												
FY 2022 to FY 2023 Increase/Decrease Statement:												

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0305304D8Z / <i>Real Property Information Management</i>	Project (Number/Name) 305 / <i>RP Information Management</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
FY23 funding level reflects restored funding after re-phasing in prior years.			
Accomplishments/Planned Programs Subtotals		0.816	1.878
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
Program utilizes Washington Headquarters Services Acquisition Directorate for EEIM contract support requirements.			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0305304D8Z / Real Property Information Management				Project (Number/Name) 305 / RP Information Management					
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
El&E Data Analytics & Integration Platform	C/FFP	FTC : Herndon VA	3.539	0.200	Mar 2021	0.000		-		-		-	Continuing	Continuing	-
Subtotal			3.539	0.200		0.000		-		-		-	Continuing	Continuing	N/A
Remarks															
Operations, maintenance and continued development of reports and tools for DAIS are planned to be added as a task in the main BSI support contract in FY22. Tis is in support of our continued effort to reduce the number of contracts managed by DASD Real Property.															
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
BSI Support Contract Base Plus 4 Option Years	C/FFP	ANSER : Mark Center	8.910	-		1.878	Apr 2022	6.000	Apr 2023	-		6.000	Continuing	Continuing	-
Defense Installation Spatial Data Infrastructure (DISDI) IGI&S Portal	MIPR	USACE : CRREL	1.298	0.100	May 2021	-		1.461		-		1.461	Continuing	Continuing	-
BSI Support Contract Re-compete (7 Month Base)	C/FFP	TBD : Mark Center	2.468	0.516	Apr 2021	-		-		-		-	Continuing	Continuing	-
Subtotal			12.676	0.616		1.878		7.461		-		7.461	Continuing	Continuing	N/A
Remarks															
DAIS support contract goes away in FY22 and BSI support contract will continue to support DAIS as a added task 14.															
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			16.215	0.816		1.878		7.461		-		7.461	Continuing	Continuing	N/A
Remarks															
NA															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0305304D8Z / <i>Real Property Information Management</i>	Project (Number/Name) 305 / <i>RP Information Management</i>	

ID	Task Name	Start	Finish	2021				2022				2023			
				Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
1	EI&E DBS PfM Reviews	10/01/18	continuous												
2	Develop BEA Artifacts	01/01/21	30/01/2023												
3	Business Process Re-Engineering	01/01/17	09/30/22												
4	RPIM Updates	11/01/20	Continuous												
5	Basing Decision Tree BPR	10/01/20	03/20/22												
6	IV&V	10/01/18	continuous												
7	EI&E Processes Auditability	10/01/20	Continuous												
8	EI&E Data Analytics & Integration	10/01/21	09/30/23												
9	DISDI IGI&S Portal	10/01/21	09/30/23												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0305304D8Z / Real Property Information Management	Project (Number/Name) 305 / RP Information Management	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>PfM</i>				
El&E DBS PfM Reviews	1	2018	4	2023
Develop El&E BEA Artifacts	2	2021	1	2023
Real Property BPRs	1	2017	4	2022
<i>Real Property Asset Management</i>				
RPIM Updates	1	2020	4	2023
Basing Moves Decision Tree BPR	2	2021	4	2023
IV&V	1	2018	4	2023
Real Property Process & System Auditability	1	2020	4	2023
Real Property Data Analytics & Integration	1	2021	4	2023
DISDI IGI&S Portal, Map, tools, and reports development and integration	1	2021	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0305304D8Z / <i>Real Property Information Management</i>				Project (Number/Name) 306 / <i>DoD Application</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
306: <i>DoD Application</i>	2.035	0.000	0.336	0.000	-	0.000	0.000	0.000	0.000	0.000	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification The DoD Application is charged by statute to identify technical mitigation measures necessary to overcome degradation of radars from the proliferation of industrial wind turbine development. This research and development is necessary to work with Federally Funded Research and Development Centers (FFRDCs) to study potential technical improvements to radars.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: DoD Application Description: The DoD Application works with FFRDCs to identify technical mitigation measures necessary to overcome degradation of radars from the proliferation of industrial wind turbine development. This research and development is necessary to study potential technical improvements to radars. FY 2022 Plans: N/A FY 2023 Plans: N/A FY 2022 to FY 2023 Increase/Decrease Statement: N/A									0.000	0.336	0.000	
Accomplishments/Planned Programs Subtotals									0.000	0.336	0.000	
C. Other Program Funding Summary (\$ in Millions) N/A Remarks N/A												
D. Acquisition Strategy N/A												

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense													Date: April 2022		
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0305304D8Z / Real Property Information Management						Project (Number/Name) 306 / DoD Application			

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Coordinate Tech Studies to overcome impacts to Radar	FFRDC	FFRDC : TBD	2.035	0.000		0.336		0.000		0.000		0.000	Continuing	Continuing	-
Subtotal			2.035	0.000		0.336		0.000		0.000		0.000	Continuing	Continuing	N/A

Remarks N/A															
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	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2.035	0.000		0.336		0.000		0.000		0.000	Continuing	Continuing	N/A

Remarks N/A															
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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense										Date: April 2022			
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0305304D8Z / <i>Real Property Information Management</i>					Project (Number/Name) 306 / <i>DoD Application</i>			

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
DoD Application																												
Develop FY 2020 Program																												
FY 2020 Study Eval																												
Develop FY 2021 Program																												
FY 2021 Study Evaluation																												
FY 2022 Study Evaluation																												

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
DoD Application																												
Develop FY 2020 Program																												
FY 2020 Study Eval																												
Develop FY 2021 Program																												
FY 2021 Study Evaluation																												
FY 2022 Study Evaluation																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0305304D8Z / <i>Real Property Information Management</i>	Project (Number/Name) 306 / <i>DoD Application</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>DoD Application</i>				
Develop FY 2020 Program	1	2019	4	2019
FY 2020 Study Eval	1	2020	4	2020
Develop FY 2021 Program	4	2019	3	2020
FY 2021 Study Evaluation	1	2021	4	2021
FY 2022 Study Evaluation	1	2022	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0305304D8Z / <i>Real Property Information Management</i>				Project (Number/Name) 307 / <i>RP Clearinghouse</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
307: <i>RP Clearinghouse</i>	0.205	2.336	0.000	0.660	-	0.660	0.619	0.542	0.540	0.540	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification The DoD Siting Clearinghouse is charged by statute to identify technical mitigation measures necessary to overcome degradation of radar from the proliferation of industrial wind turbine development. This research and development is necessary to work with Federally Funded Research and Development Centers (FFRDCs) to study potential technical improvements to radar.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: RP Clearinghouse Description: The DoD Siting Clearinghouse works with FFRDCs to identify technical mitigation measures necessary to overcome degradation of radar from the proliferation of industrial wind turbine development. This research and development is necessary to study potential technical improvements to radar. FY 2022 Plans: Continue to support radar studies as planned through the Wind Turbine Interference Mitigation Forum. FY 2023 Plans: Continue to support radar studies as planned through the Wind Turbine Interference Mitigation Forum. FY 2022 to FY 2023 Increase/Decrease Statement: The DoD Clearinghouse has an increase in funding starting FY 2023 reflecting congressional emphasis on increased mission capability.									2.336	0.000	0.660	
Accomplishments/Planned Programs Subtotals									2.336	0.000	0.660	
C. Other Program Funding Summary (\$ in Millions) N/A Remarks N/A D. Acquisition Strategy N/A												

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0305304D8Z / <i>Real Property Information Management</i>						Project (Number/Name) 307 / <i>RP Clearinghouse</i>			
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
DISDI Portal	C/FFP	USACE Contracted Vendor : USACE	0.005	-		0.000	Mar 2022	-		-		-	Continuing	Continuing	-
Subtotal			0.005	-		0.000		-		-		-	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Platform Resilience Mission Assurance (PRMA)	MIPR	ARMAMENT RDEC : BLDG 91 4TH AVE, PICATINNY ARSENAL NJ 07806-5000	0.200	0.336		-		-		-		-	Continuing	Continuing	-
Continue to support radar studies as planned through the Wind Turbine Interference Mitigation Forum.	FFRDC	TBD : TBD	0.000	2.000	May 2021	0.000	May 2022	0.660	May 2023	-		0.660	Continuing	Continuing	-
Subtotal			0.200	2.336		0.000		0.660		-		0.660	Continuing	Continuing	N/A
Remarks NA															
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.205	2.336		0.000		0.660		-		0.660	Continuing	Continuing	N/A
Remarks NA															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0305304D8Z / <i>Real Property Information Management</i>	Project (Number/Name) 307 / <i>RP Clearinghouse</i>	

ID	Task Name	Start	Finish	2020				2021				2022				2023			
				Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
1	Develop FY-21 Program	10/01/20	06/30/20																
2	FY-21 Study Eval	01/01/21	09/30/21																
3	Develop FY-22 Program	10/01/21	06/30/21																
4	FY-22 Study Eval	01/01/22	09/30/22																
5	Develop FY-23 Program	10/01/22	06/30/22																
6	FY-23 Study Eval	01/01/23	09/30/23																

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0305304D8Z / <i>Real Property Information Management</i>	Project (Number/Name) 307 / <i>RP Clearinghouse</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>RP Siting Clearinghouse</i>				
Develop FY 2021 Program	1	2020	3	2020
FY 2021 Studies Evaluations	1	2021	4	2021
Develop FY 2022 Program	1	2021	4	2021
FY 2022 Studies Evaluations	1	2022	4	2022
Develop FY 2023 Program	1	2022	4	2022
FY 2023 Studies Evaluations	1	2023	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: Research, Development, Test & Evaluation, Defense-Wide I BA 5: System Development & Demonstration (SDD)					PE 0305310D8Z I CWMD Systems: System Development Demonstration							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	36.358	19.817	20.132	16.048	-	16.048	18.717	17.650	17.803	18.526	-	-
813: CWMD Systems: System Development & Demonstration	36.358	19.817	20.132	16.048	-	16.048	18.717	17.650	17.803	18.526	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression, Defend the Homeland, Provide Nuclear Deterrence, and Build Sustainable and Long-Term Advantage.

The Countering Weapons of Mass Destruction (CWMD) Systems portfolio aligns with the National Defense Strategy objective of “dissuading, preventing, or deterring state adversaries and non-state actors from acquiring, proliferating, or using weapons of mass destruction.”

The CWMD Systems portfolio enhances warfighter lethality by developing capabilities to exploit and defeat critical nodes of nuclear, chemical, and biological weapons and ballistic missile programs and proliferation networks; and developing offensively-oriented capabilities to disrupt Weapons of Mass Destruction (WMD) proliferation networks and detect, disable, or defeat WMD and delivery systems. Investments result in capabilities fielded to the Joint Force, enabling it to reduce WMD threats and create options for the United States to prevent WMD use.

The Office of the Secretary of Defense uses the CWMD Systems portfolio to invest strategically in projects across the Military Services, Combatant Commands, and Defense Agencies. Funding is prioritized for projects that close Joint Force warfighter capability gaps. An annual investment strategy is used to meet emergent operational and capability needs validated by the Joint Force, yielding new fielded capabilities within one to two years.

The CWMD Systems: Systems Development and Demonstration program invests in maturation of prototypes; integration of technologies, systems and components; developmental and operational test and evaluation; and transition to fielded capabilities that counter WMD proliferation. This program accelerates and enables transition of mature technologies to fielded capabilities by leveraging significant science and technology (S&T) investments made by the Department of Defense, other Federal agencies, and industry. Resulting fielded capabilities illuminate WMD networks; exploit vulnerabilities in networks, programs, facilities, and weapons systems; and disable or defeat WMD and their delivery systems.

This program funds labor, materials, and travel to support the requirements of this program, performed by a government agency or by private individuals or organizations under a contract with the government, for activities and acquisitions including Research, Development, Test & Evaluation (RDT&E), assessments and analyses, research studies, education, and other activities related to capability development and fielding.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
0400: Research, Development, Test & Evaluation, Defense-Wide I BA 5: System Development & Demonstration (SDD)		PE 0305310D8Z I CWMD Systems: System Development Demonstration			
B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	20.572	20.246	0.000	-	0.000
Current President's Budget	19.817	20.132	16.048	-	16.048
Total Adjustments	-0.755	-0.114	16.048	-	16.048
• Congressional General Reductions	-	-0.114			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.755	-			
• Adjustments to Budget Year	-	-	16.048	-	16.048
Change Summary Explanation					
FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0305310D8Z / CWMD Systems: System Development Demonstration				Project (Number/Name) 813 / CWMD Systems: System Development & Demonstration			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
813: CWMD Systems: System Development & Demonstration	36.358	19.817	20.132	16.048	-	16.048	18.717	17.650	17.803	18.526	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

The Countering Weapons of Mass Destruction (CWMD) Systems portfolio aligns with the National Defense Strategy objective of “dissuading, preventing, or deterring state adversaries and non-state actors from acquiring, proliferating, or using weapons of mass destruction.”

The CWMD Systems portfolio enhances warfighter lethality by developing capabilities to exploit and defeat critical nodes of nuclear, chemical, and biological weapons and ballistic missile programs and proliferation networks; and developing offensively-oriented capabilities to disrupt Weapons of Mass Destruction (WMD) proliferation networks and detect, disable, or defeat WMD and delivery systems. Investments result in capabilities fielded to the Joint Force, enabling it to reduce WMD threats and create options for the United States to prevent WMD use.

The Office of the Secretary of Defense uses the CWMD Systems portfolio to invest strategically in projects across the Military Services, Combatant Commands, and Defense Agencies. Funding is prioritized for projects that close Joint Force warfighter capability gaps. An annual investment strategy is used to meet emergent operational and capability needs validated by the Joint Force, yielding new fielded capabilities within one to two years.

The CWMD Systems: Systems Development and Demonstration program invests in maturation of prototypes; integration of technologies, systems and components; developmental and operational test and evaluation; and transition to fielded capabilities that counter WMD proliferation. This program accelerates and enables transition of mature technologies to fielded capabilities by leveraging significant science and technology (S&T) investments made by the Department of Defense, other Federal agencies, and industry. Resulting fielded capabilities illuminate WMD networks; exploit vulnerabilities in networks, programs, facilities, and weapons systems; and disable or defeat WMD and their delivery systems.

This program funds labor, materials, and travel to support the requirements of this program, performed by a government agency or by private individuals or organizations under a contract with the government, for activities and acquisitions including Research, Development, Test & Evaluation (RDT&E), assessments and analyses, research studies, education, and other activities related to capability development and fielding.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: P*813 / CWMD Systems: System Development & Demonstration	19.817	20.132	16.048

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 5		R-1 Program Element (Number/Name) PE 0305310D8Z / CWMD Systems: System Development Demonstration	Project (Number/Name) 813 / CWMD Systems: System Development & Demonstration		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>Description: The CWMD Systems: Systems Development and Demonstration program invests in maturation of prototypes; integration of technologies, systems and components; developmental and operational test and evaluation; and transition to fielded capabilities that counter Weapons of Mass Destruction (WMD) proliferation. Significant Science and Technology (S&T) investments in prototype development by the Department of Defense, other Federal agencies, and industry are leveraged, capitalizing on mature technologies to accelerate and enable transition to fielded capabilities. Resulting fielded capabilities illuminate WMD networks; exploit vulnerabilities in networks, programs, facilities, and weapons systems; and disable or defeat WMD and their delivery systems.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none">• Develop, transition, and field operational CWMD capabilities to US Special Operations Command.• Partner with the Military Services to mature and transition advanced prototypes to fielded CWMD capabilities.• Develop and deliver capabilities that enhance Air Force Technical Applications Center (AFTAC) ability to support nuclear treaty monitoring and nuclear event detection.• Continue maturation of prototypes, systems, and components for test and evaluation by end-users and transition to fieldable CWMD capabilities under other classified projects. <p>FY 2023 Plans:</p> <ul style="list-style-type: none">• Develop, transition, and field operational CWMD capabilities to US Special Operations Command.• Partner with the Military Services to mature and transition advanced prototypes to fielded CWMD capabilities.• Develop and deliver capabilities that enhance Air Force Technical Applications Center (AFTAC) ability to support nuclear treaty monitoring and nuclear event detection.• Continue maturation of prototypes, systems, and components for test and evaluation by end-users and transition to fieldable CWMD capabilities under other classified projects. <p>FY 2022 to FY 2023 Increase/Decrease Statement: The FY2023 funding decrease will result in the resourcing of 3-5 fewer advanced Research & Development (R&D) projects, and fewer CWMD capabilities fielded to the joint force.</p>					
Accomplishments/Planned Programs Subtotals			19.817	20.132	16.048
C. Other Program Funding Summary (\$ in Millions)					
N/A					
Remarks					
N/A					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0305310D8Z / CWMD Systems: System Development Demonstration	Project (Number/Name) 813 / CWMD Systems: System Development & Demonstration
D. Acquisition Strategy <p>The Office of the Deputy Assistant Secretary of Defense for Threat Reduction and Arms Control (ODASD(TRAC)) establishes annual priorities based on national and the DoD strategies and senior leader guidance. Based on those priorities, TRAC solicits project proposals from Combatant Commands, Military Services, and Defense Agencies, and interagency partners. To be selected, a proposed project must have a validated requirement, an engaged requirement champion, a viable acquisition strategy, and a qualified program management office. A technology project must identify its starting and desired end-state Technology Readiness Level. Likewise, the end-user for any proposed project must demonstrate a long-term plan for acceptance and sustainment of a fieldable capability. Project period of performance is typically 12-18 months.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0305310D8Z / CWMD Systems: System Development Demonstration						Project (Number/Name) 813 / CWMD Systems: System Development & Demonstration			
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering & manufacturing development of information systems & components	C/T&M	TBD : TBD	18.179	9.908	Jan 2021	-		-		-		-	-	-	-
Systems development & demonstration, and initial operational test & evaluation	C/T&M	TBD : TBD	14.543	7.927	Jan 2021	-		-		-		-	-	-	-
Program management support	C/T&M	TBD : TBD	3.636	1.982	Jan 2021	-		-		-		-	-	-	-
Develop and transition fieldable CWMD capabilities to US Special Operations Command and its components	MIPR	USSOCOM : TBD	-	-		9.157	Jan 2022	8.586	Jan 2023	-		8.586	-	-	N/A
Partner with the Services to develop advanced prototypes and fielded CWMD capabilities.	MIPR	TBD : TBD	-	-		3.257	Jan 2022	2.600	Jan 2023	-		2.600	-	-	N/A
Deliver toolkits and applications that enhance Air Force Technical Applications Center (AFTAC) capabilities to support nuclear treaty monitoring and nuclear event detection.	MIPR	AFTAC : TBD	-	-		3.444	Jan 2022	2.744	Jan 2023	-		2.744	-	-	N/A
Continue maturation of prototypes, systems, and components for test and evaluation by end-users and transition to fieldable capabilities of other classified projects.	MIPR	TBD : TBD	-	-		4.274	Jan 2022	2.118	Jan 2023	-		2.118	-	-	N/A
Subtotal			36.358	19.817		20.132		16.048		-		16.048	-	-	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0305310D8Z / CWMD Systems: System Development Demonstration					Project (Number/Name) 813 / CWMD Systems: System Development & Demonstration				

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks N/A															
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			36.358	19.817		20.132		16.048		-		16.048	-	-	N/A
Remarks NA															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense

Date: April 2022

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0400 / 5

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PE 0305310D8Z / CWMD Systems: System Development Demonstration

Project (Number/Name)	Start Date	End Date	Duration (Days)	Progress (%)	Status	Notes
101	2023-01-01	2023-01-15	14	100	Completed	Project 101 completed on time.
102	2023-01-15	2023-02-01	16	75	In Progress	Project 102 is 75% complete.
103	2023-02-01	2023-02-15	14	50	In Progress	Project 103 is 50% complete.
104	2023-02-15	2023-03-01	15	25	In Progress	Project 104 is 25% complete.
105	2023-03-01	2023-03-15	14	10	In Progress	Project 105 is 10% complete.
106	2023-03-15	2023-03-31	15	0	Not Started	Project 106 has not started yet.
107	2023-03-31	2023-04-15	15	0	Not Started	Project 107 has not started yet.
108	2023-04-15	2023-04-30	15	0	Not Started	Project 108 has not started yet.
109	2023-04-30	2023-05-15	15	0	Not Started	Project 109 has not started yet.
110	2023-05-15	2023-05-31	15	0	Not Started	Project 110 has not started yet.

813 / CWMD Systems: System Development & Demonstration

CWMD Systems: Operational System Development
BA 5 / PE 0305310D8Z

FY18				FY19				FY20				FY21				FY22				FY23				FY24				FY25				FY26																
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4													
Engineering & manufacturing development of information systems & components																																																
Systems development & demonstration, and initial operational test & evaluation																																																
Program management support																																																

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0305310D8Z / CWMD Systems: System Development Demonstration	Project (Number/Name) 813 / CWMD Systems: System Development & Demonstration	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Develop and transition fieldable Countering Weapons of Mass Destruction (CWMD) capabilities to US Special Operations Command and its components</i>				
Develop and transition fieldable CWMD capabilities to US Special Operations Command and its components	2	2022	4	2026
<i>Partner with the Services to develop advanced prototypes and fielded CWMD capabilities.</i>				
Partner with the Services to develop advanced prototypes and fielded CWMD capabilities.	2	2022	4	2026
<i>Deliver toolkits and applications that enhance Air Force Technical Applications Center (AFTAC) capabilities to support nuclear treaty monitoring and nuclear event detection.</i>				
Deliver toolkits and applications that enhance Air Force Technical Applications Center (AFTAC) capabilities to support nuclear treaty monitoring and nuclear event detection.	2	2022	4	2026
<i>Continue maturation of prototypes, systems, and components for test and evaluation by end-users and transition to fieldable capabilities of other classified projects.</i>				
Continue maturation of prototypes, systems, and components for test and evaluation by end-users and transition to fieldable capabilities of other classified projects.	2	2022	4	2026
<i>Engineering & manufacturing development of information systems & components</i>				
Engineering & manufacturing development of information systems & components	2	2020	4	2021
<i>Systems development & demonstration, and initial operational test & evaluation</i>				
Systems development & demonstration, and initial operational test & evaluation	2	2020	4	2021
<i>Program management support</i>				
Program management support	2	2020	4	2021

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 6: RDT&E Management Support	R-1 Program Element (Number/Name) PE 0604774D8Z I Defense Readiness Reporting System (DRRS)
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	57.883	9.586	7.167	8.902	-	8.902	12.673	11.427	10.593	10.805	-	-
774: Defense Readiness Reporting System (DRRS)	57.883	9.586	7.167	8.902	-	8.902	12.673	11.427	10.593	10.805	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Take Care of People and Build Sustainable and Long-Term Advantage.

This funding supports the Defense Readiness Reporting System - Strategic (DRRS-S), the comprehensive readiness reporting system for the Department of Defense mandated under Title 10 U.S. Code. The system measures, in an objective, accurate, and timely manner, the capability of the armed forces to carry out the National Security Strategy prescribed by the President, as well as, the defense planning guidance provided by the Secretary of Defense, and the National Military Strategy prescribed by the Chairman of the Joint Chiefs of Staff. DRRS-S hosts information and applications used to support the Geographic and Functional Combatant Commanders, the Services, Combat Support Agencies, the Joint Staff and the Office of the Secretary of Defense.

DRRS-S is the evolution of readiness reporting to a more comprehensive system, better able to meet the Department's current and future readiness information challenges. Included in these challenges is the expansion in scope of the entities who can, and do report readiness. Shifting from solely resource centric readiness reporting to a resource informed mission/capabilities based reporting system, oriented towards the National Military Strategy (NMS), makes substantially more complex demands on readiness reporting, but portrays a far more relevant and holistic picture of readiness. DRRS-S allows the Department to assess readiness globally based on the program's integrated ability to project and sustain a mix of constructed forces. Additionally, the challenges associated with sourcing and evaluating the readiness of our forces engaged in on-going real operations, mean that force managers need applications that will query the entire Department for suitable, available organizations to meet current needs. DRRS-S continues to incorporate more data and develop more capable functionality to meet the evolving needs of both the operational employers of the Force, but also those responsible for Force Generation.

The National Defense Authorization Act for FY 2019 made revisions to Title 10 U.S. Code and provided the Department of Defense direction requiring growth in the DRRS-S program and identified the program's need to maintain the technical currency necessary to quickly meet future challenges associated with providing senior leaders with relevant and timely information. Such initiatives include implementing the complex data structures and visualization tools needed to operationalize the Global Force Management - Data Initiative, and reporting at lower organizational levels consistent with how Forces are employed.

The reduction of \$341,000 was due to the Congressional general reduction of all FFRDC funding.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support	R-1 Program Element (Number/Name) PE 0604774D8Z / Defense Readiness Reporting System (DRRS)
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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	9.793	7.508	0.000	-	0.000
Current President's Budget	9.586	7.167	8.902	-	8.902
Total Adjustments	-0.207	-0.341	8.902	-	8.902
• Congressional General Reductions	-	-0.341			
• Congressional Directed Reductions	-0.002	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.026	-			
• SBIR/STTR Transfer	-0.179	-			
• Adjustments to Budget Year	-	-	8.902	-	8.902

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

FY 2023 funding increase also reflects planned surge in development efforts to support implementation of readiness reporting reforms, temporarily delayed by the consolidation of reporting systems with DRRS-S and reporting policy revision.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0604774D8Z / Defense Readiness Reporting System (DRRS)				Project (Number/Name) 774 / Defense Readiness Reporting System (DRRS)			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
774: Defense Readiness Reporting System (DRRS)	57.883	9.586	7.167	8.902	-	8.902	12.673	11.427	10.593	10.805	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding supports the Defense Readiness Reporting System - Strategic (DRRS-S), the comprehensive readiness reporting system for the Department of Defense mandated under Title 10 U.S. Code. The system measures, in an objective, accurate, and timely manner, the capability of the armed forces to carry out the National Security Strategy prescribed by the President, as well as the defense planning guidance provided by the Secretary of Defense, and the National Military Strategy prescribed by the Chairman of the Joint Chiefs of Staff. DRRS-S hosts information and applications used to support the Geographic and Functional Combatant Commanders, the Services, Combat Support Agencies, the Joint Staff and the Office of the Secretary of Defense.

DRRS-S is the evolution of readiness reporting to a more comprehensive system, better able to meet the Department's current and future readiness information challenges. Included in these challenges is the expansion in scope of the entities who can, and do report readiness. Shifting from solely resource centric readiness reporting, to a resource informed mission/capabilities based reporting system, oriented towards the National Military Strategy (NMS), makes substantially more complex demands on readiness reporting, but portrays a far more relevant and holistic picture of readiness. DRRS-S allows the Department to assess readiness globally based on the program's integrated ability to project and sustain a mix of constructed forces. Additionally, the challenges associated with sourcing and evaluating the readiness of our forces engaged in on-going real operations mean that force managers need applications that will query the entire Department for suitable, available organizations to meet current needs. DRRS-S continues to incorporate more data and develop more capable functionality to meet the evolving needs of both the operational employers of the Force, but also those responsible for Force Generation.

The National Defense Authorization Act for FY 2019 made revisions to Title 10 U.S. Code directing the Department of Defense to take actions which required growth in the DRRS-S program. The legislation identified the program's need to achieve and maintain the technical currency necessary to quickly meet future challenges associated with providing senior leaders with relevant and timely information. Such initiatives include implementing the complex data structures and visualization tools required to operationalize the Global Force Management - Data Initiative, and reporting at lower organizational levels consistent with how the Department's forces are employed.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: 774 Defense Readiness Reporting System	9.586	7.167	8.902
Description: The Defense Readiness Reporting System (DRRS) establishes a capabilities-based, adaptive, near real-time readiness information system for DoD. DRRS measures the readiness of military forces and supporting infrastructure to meet missions and goals assigned by the Secretary of Defense. The realization of DRRS required integrating a host of key technologies to achieve an information system that supports distributed, collaborative, and dynamic readiness reporting in addition			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0604774D8Z / <i>Defense Readiness Reporting System (DRRS)</i>	Project (Number/Name) 774 / <i>Defense Readiness Reporting System (DRRS)</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>to continuous tool-based assessment. The primary technical goal was the creation of a highly reliable and securely integrated readiness data environment to leverage and extend current readiness information systems. DRRS contains readiness metrics and supporting data for forces and support organizations.</p> <p><i>FY 2022 Plans:</i></p> <ul style="list-style-type: none"> • Complete readiness reporting systems consolidation and improvements within DRRS-S • Integration into DRRS-S of data sources and the creation of new functionality necessary to support readiness reporting reform efforts. • Continued enhancement of program architecture to make use of hosting technology advancements. • Incorporate new and enhanced functionality required by evolving readiness reporting needs. • Continued GFM DI integration and functionality development. • Replacement of vulnerable & legacy software components. <p><i>FY 2023 Plans:</i></p> <ul style="list-style-type: none"> • Integration into DRRS-S of data sources and the creation of new functionality necessary to support readiness reporting reform efforts. • Refinement of Service-specific input tools for improved performance within the DRRS application. • Continued enhancement of program architecture to make use of hosting technology advancements. • Incorporate new and enhanced functionality required by evolving readiness reporting needs. • Continued GFM DI integration and functionality development. • Replacement of vulnerable & legacy software components. <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i></p> <p>The FY 2023 funding increase reflects planned surge in development efforts to support implementation of readiness reporting reforms, temporarily delayed by the consolidation of reporting systems with DRRS-S and reporting policy revision.</p>			
Accomplishments/Planned Programs Subtotals		9.586	7.167
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support</i>	PE 0604875D8Z / <i>Joint Systems Architecture Development</i>											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	36.697	8.180	7.815	6.610	-	6.610	8.591	8.261	7.741	7.733	Continuing	Continuing
875: <i>Portfolio Systems Acquisition (PSA)</i>	29.717	4.005	4.526	3.854	-	3.854	4.845	4.675	4.412	4.407	Continuing	Continuing
220: <i>Electronic Warfare Executive Committee</i>	6.980	4.175	3.289	2.756	-	2.756	3.746	3.586	3.329	3.326	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's Initiative to Build Sustainable and Long-Term Advantage.

The Joint Systems Architecture Development (JSAD) program directly supports the first priority of the 2018 National Defense Strategy, which is to increase lethality. All efforts within the Office of the Deputy Assistant Secretary of Defense (DASD) for Platform and Weapon Portfolio Management (PWPM) strive to deliver the warfighter the best equipment and systems, and to do so by performing top down, national security strategy-driven capabilities-based planning by fully leveraging Department and acquisition reform initiatives.

Department of Defense (DoD) Instruction 5000.02 and Chairman of the Joint Chiefs of Staff Instruction 3170.01 promulgate capabilities-based requirements and acquisition processes. The JSAD program enables collaborative efforts to achieve these goals with a focus on Major Defense Acquisition Programs (MDAPs). These efforts entail use of Capability Portfolio Management, as well as application of mission engineering to develop mission threads; assessments of joint capability areas and joint integrating concepts, development of system-related data, integrated roadmaps to support acquisition investment decisions, and assessments of MDAPs in a capability area context. Activities in the JSAD project are divided into three areas:(1) capability-based analysis; (2) roadmaps; and (3) support tools and guidance. Capability-based analysis provides analysis of the different technology, functionality, and integration impacts of systems on warfighting capability. Acquisition roadmaps guide systems development and associated investment plans. JSAD support tools and guidance initiatives develop systems data, and tools, exploit modeling and simulation and architecture efforts to improve DoD's overall assessment capability. These efforts guide the development and improve the testing and fielding of integrated systems of systems in order to achieve Joint mission capabilities.

The Department uses enterprise-wide approaches which include:(1) horizontal integration within the Department and unity of effort through greater interagency collaboration; (2) engaging in a coordinated and portfolio-based approach to planning, programming, budgeting and execution; and (3) significant reforms at the governance, management and execution levels. To accomplish this intent, there needs to be a focused goal and concerted emphasis on shifting from systems acquisition to capabilities-based portfolio management (or portfolio systems acquisition). This program enables collaborative efforts to implement the Quadrennial Defense Review (QDR) direction in order to achieve portfolio systems acquisition goals. The program is broken up into two focus areas; Capability Portfolio Management and Reform Initiatives.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0604875D8Z I <i>Joint Systems Architecture Development</i>
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B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	8.492	7.859	0.000	-	0.000
Current President's Budget	8.180	7.815	6.610	-	6.610
Total Adjustments	-0.312	-0.044	6.610	-	6.610
• Congressional General Reductions	-	-0.044			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.312	-			
• Adjustments to Budget Year	-	-	6.610	-	6.610

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0604875D8Z / Joint Systems Architecture Development				Project (Number/Name) 875 / Portfolio Systems Acquisition (PSA)			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
875: Portfolio Systems Acquisition (PSA)	29.717	4.005	4.526	3.854	-	3.854	4.845	4.675	4.412	4.407	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Department continues to use enterprise-wide approaches which are met through: (1) horizontal integration within the Department and unity of effort through greater interagency collaboration; (2) engaging in a coordinated and portfolio-based approach to planning, programming, budgeting and execution; and (3) significant reforms at the governance, management and execution levels. The Adaptive Acquisition Framework process, enacted in 2019 and 2020 as part of acquisition reform, provides the Defense Acquisition Executive and the Service Acquisition Executives alternative acquisition paths for rapid prototyping and rapid acquisition, in an effort to use the fastest, most affordable, and efficient way to deliver new weapon systems with mature technologies while it maintains disciplined systems engineering approaches. The Department will improve how it matches requirements with mature technologies while it maintains disciplined systems engineering approaches. To accomplish this direction, there needed to be a focused goal and concerted emphasis on shifting from acquisition of individual systems to Capability Portfolio Management. This program enables collaborative efforts to implement the NDR direction outlined above and achieve portfolio systems acquisition goals and to develop and implement acquisition reform initiatives.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Portfolio Systems Acquisition (PSA)	4.005	4.526	3.854
Description: The program is broken up into two focus areas, Portfolio Management and Reform Initiatives, and consolidates work previously performed under various other Program Elements			
FY 2022 Plans: <ul style="list-style-type: none"> - Efforts to further develop Capability Portfolio Management practices, including supporting Mission Engineering principles in an effort to make both practices more widespread in use through the Office of the Secretary of Defense, the Joint Staff, and the services. - Further develop portfolio management of programs falling within the Air, Ground, Maritime and Electromagnetic Warfare mission areas, to include application of mission engineering analysis of kill chains. - Identify portfolio and program synergies, reduce duplication, and identify opportunities for cost savings. - Provide technical expertise in support of warfare area portfolios. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0604875D8Z / <i>Joint Systems Architecture Development</i>	Project (Number/Name) 875 / <i>Portfolio Systems Acquisition (PSA)</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> - Evaluate progress of program management initiatives and continue support to a variety of certification and qualification standards activities. - Update roadmaps and, where appropriate, generate new roadmaps to guide investments in critical areas (e.g., future vertical lift, unmanned systems, ground vehicles, weapons/munitions, and Integrated Air and Missile Defense (IAMD)). - Provide analytical support for the ground combat vehicle portfolio. - Provide analytical support for the naval warfare portfolio. - Provide analytical support for the munitions process, from requirements generation to demilitarization. - Further implement Mission Engineering practices within A&S to evaluate warfighter priority mission areas with a rigorous, data-driven analytic process to determine how systems work together in an operationally relevant environment and identify ways to integrate technology and systems to provide affordable capability solutions for our warfighters. - Respond to Government Accountability Office inquiries. - Respond to DOD Inspector General inquiries. - Review Council on Foreign Investment in the United States cases. - Reshape focus and drive solution-oriented outcomes and decisions in all senior-level leadership meetings for the F-35 program to include Executive Steering Groups, and other information and decision forums. - Collaborate and shape outcomes across all Programming and Budget Review activities such as Strategic Portfolio Reviews (SPRs), Issue Teams, Competitive Area Studies. - Provide support and participate, as needed, in the Joint Capabilities Integration and Development process, to include functional warfare working groups, Functional Capabilities Boards , Joint Capabilities Boards, and Joint Requirements Oversight Council. - Lead, participate in, and provide support to the SPRs and assigned issue paper teams. - Provide support to the Deputy's Management Action Group and shape outcomes through analytical efforts. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0604875D8Z / <i>Joint Systems Architectu re Development</i>	Project (Number/Name) 875 / <i>Portfolio Systems Acquisition (PSA)</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> - Provide support to the Secretary's Weekly Priority Review. - Provide support to the 3 Star Programmer's meetings. <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue efforts to further develop Capability Portfolio Management practices, including supporting Mission Engineering principles in an effort to make both practices more widespread in use through the Office of the Secretary of Defense, the Joint Staff, and the services. - Further develop portfolio management of programs falling within the Air, Ground, Maritime and Electromagnetic Warfare mission areas, to include application of mission engineering analysis of kill chains. - Continue to identify portfolio and program synergies, reduce duplication, and identify opportunities for cost savings. - Continue to provide technical expertise in support of warfare area portfolios. - Continue to assess progress of program management initiatives and continue support to a variety of certification and qualification standards activities. - Continue to update roadmaps and, where appropriate, generate new roadmaps to guide investments in critical areas (e.g., future vertical lift, unmanned systems, ground vehicles, weapons/munitions, and Integrated Air and Missile Defense (IAMD)). - Continue analytical support for the ground combat vehicle portfolio. - Continue analytical support for the naval warfare portfolio. - Continue analytical support for the munitions process, from requirements generation to demilitarization. - Further implement Mission Engineering practices within A&S to evaluate warfighter priority mission areas with a rigorous, data-driven analytic process to determine how systems work together in an operationally relevant environment and identify ways to integrate technology and systems to provide affordable capability solutions for our warfighters. - Respond to Government Accountability Office inquiries. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0604875D8Z / <i>Joint Systems Architecture Development</i>	Project (Number/Name) 875 / <i>Portfolio Systems Acquisition (PSA)</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> - Respond to DOD Inspector General inquiries. - Review Council on Foreign Investment in the United States cases. - Continue to reshape focus and drive solution-oriented outcomes and decisions in all senior-level leadership meetings for the F-35 program to include Executive Steering Groups and other information and decision forums. - Continue to collaborate and shape outcomes across all Programming and Budget Review activities such as Strategic Portfolio Reviews, Issue Teams, Competitive Area Studies. - Continue to provide support and participate, as needed, in the Joint Capabilities Integration and Development process, to include functional warfare working groups, Functional Capabilities Boards, Joint Capabilities Boards and Joint Requirements Oversight Council. - Continue to lead, participate in, and provide support to the Strategic Portfolio Reviews and assigned issue paper teams. - Continue to provide support to the Deputy's Management Action Group and shape outcomes through analytical efforts. - Continue to provide support to the Secretary's Weekly Priority Review. - Continue to provide support to the 3 Star Programmer's meetings. <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> The decrease from FY22 to FY23 funding levels will defer planned analysis of Department investment in Airborne Electronic Attack capabilities to meet the future threat.</p>			
Accomplishments/Planned Programs Subtotals		4.005	4.526
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0604875D8Z / Joint Systems Architecture Development				Project (Number/Name) 220 / Electronic Warfare Executive Committee			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
220: Electronic Warfare Executive Committee	6.980	4.175	3.289	2.756	-	2.756	3.746	3.586	3.329	3.326	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Electromagnetic Warfare (EW) Executive Committee (EXCOM) - co-chaired by the Under Secretary of Defense for Acquisition & Sustainment (USD(A&S)), and the Vice Chairman of the Joint Chiefs of Staff (VCJCS) - is tasked to provide senior oversight, coordination, budget/capability harmonization, and advice on EW matters to the Secretary of Defense, Deputy Secretary of Defense, and the Deputy's Management Action Group. This program develops, maintains, and implements the overarching DoD EW Strategy and Implementation Plan to achieve Electromagnetic Spectrum superiority. This program provides technical analyses, technology assessments, capability and capability gap identification, intelligence and threat evaluations to inform DoD EW requirements, acquisition programs, and investment decisions. This program also advances EW needs in modeling, simulation, test, exercises, experimentation, and training. This budget exhibit also provides support to the Electromagnetic Spectrum Operations Cross Functional Team (EMSO CFT) which was established and instituted in FY 2019.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Electronic Warfare Executive Committee	4.175	3.289	2.756
Description: Funds will be used to conduct analytic assessments of fielded and planned U.S. EW capabilities, threat analysis, and physics-based modeling and simulation of electronic warfare capabilities to support the Deputy Secretary of Defense-directed EW, EXCOMM, and provide support to the EMSO CFT.			
FY 2022 Plans: - Mission engineering analyses and integration to incorporate soft kill and Electromagnetic Warfare effects and weapon systems in critical mission thread areas in order to meet evolving threats. - Develop plans and conduct Doctrine, Organization, Training, Material, Leadership and Education, Personnel, Facilities and Policy (DOTMLPF-P) initiatives to implement the Department's EW strategy. - Perform the necessary analytic underpinning to develop and field advanced EW capabilities, including EW manning, training, exercises, modeling and simulation. - Identify opportunities for Cross-Service EW collaboration, including EW research and development, acquisition programs, multi-purpose hardware and software, and other initiatives to increase EW investment efficiencies and promote interoperability.			
FY 2023 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0604875D8Z / <i>Joint Systems Architecture Development</i>	Project (Number/Name) 220 / <i>Electronic Warfare Executive Committee</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> - Continue mission engineering analyses and integration to incorporate soft kill and Electromagnetic Warfare effects and weapon systems in critical mission thread areas in order to meet evolving threats. - Continue to develop plans and conduct DOTMLPF-P initiatives to implement the Department's EW strategy. - Continue to perform the necessary analytic underpinning to develop and field advanced EW capabilities, including EW manning, training, exercises, modeling and simulation. - Continue to identify opportunities for Cross-Service EW collaboration, including EW research and development, acquisition programs, multi-purpose hardware and software, and other initiatives to increase EW investment efficiencies and promote interoperability. <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> The decrease of FY22 to FY23 funding levels will defer planned analysis of Department investment in Airborne Electronic Attack capabilities to meet the future threat. Delaying this effort impacts the Department's schedule to field advanced EW capabilities."</p>			
Accomplishments/Planned Programs Subtotals		4.175	3.289
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 6: RDT&E Management Support</i>	PE 0604940D8Z I <i>Central Test and Evaluation Investment Program (CTEIP)</i>											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	2,014.894	407.678	994.151	819.358	-	819.358	834.052	789.225	550.279	457.466	-	-
940: <i>Central Test and Evaluation Investment Program (CTEIP)</i>	2,014.894	407.678	994.151	819.358	-	819.358	834.052	789.225	550.279	457.466	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to defend the homeland, deter strategic attacks and aggression while prevailing in conflict, building enduring advantage, and building a resilient Joint Force and defense ecosystem. Since its inception in FY 1990, Central Test and Evaluation Investment Program (CTEIP) provides the development of critically needed, high-priority Test and Evaluation (T&E) capabilities for joint/multi-Service requirements. CTEIP investments address strategic requirements related to Hypersonics, Directed Energy, Cyber, Electronic Warfare, Nuclear Effects, Space, Autonomy, and Multi-Domain Operations. Other Investments in test infrastructure align with objectives in the Strategic Plan for DoD T&E Resources for high priority test needs and common range Infrastructure. The CTEIP uses a corporate investment approach to combine T&E needs from Service, Defense, and other Government agencies in order to maximize opportunities for joint efforts and avoid unwarranted duplication of test capabilities. CTEIP evaluates and selects for execution, proposals that align to the NDS and USD(R&E) priorities, provide the greatest return on investment, make efficient use of limited test resources, leverage Service investment, and promote joint solutions to fill test capability gaps. CTEIP provides enterprise solutions that benefit the whole Department. These investments are needed so test capabilities keep pace with U.S. and adversary technical advances as well as, with quickly changing threats.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	407.678	550.140	0.000	-	0.000
Current President's Budget	407.678	994.151	819.358	-	819.358
Total Adjustments	0.000	444.011	819.358	-	819.358
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program adjustment	-	-	15.779	-	15.779
• Transfer to Air Force - Lab Arnold AFB, TN	-	-	-38.000	-	-38.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense					Date: April 2022	
Appropriation/Budget Activity			R-1 Program Element (Number/Name)			
0400: Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support			PE 0604940D8Z / Central Test and Evaluation Investment Program (CTEIP)			
• Joint Electronic Warfare Dominance Test Infrastructure	-	-	276.200	-	276.200	
• DoD Microelectronics Ecosystem	-	-	41.500	-	41.500	
• Flight Test Instrumentation and Terminal Area Scoring	-	-	43.600	-	43.600	
• High Speed Test Track	-	-	23.700	-	23.700	
• Secure Telemetry and High Bandwidth Data Processing	-	-	15.000	-	15.000	
• Congressional Adjustment	-	444.478	-	-	-	
• FFRDC Adjustment	-	-0.467	-	-	-	
• Budget Year Adjustment	-	-	441.579	-	441.579	
Change Summary Explanation						
FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.						
FY 2022 Congressional addition of \$444.478M improves the following capabilities: 1) enhanced hypersonic ground test capability and throughput by reactivating previously decommissioned synthetic air hypersonic propulsion test facilities, including the relocation of affected NASA capabilities or facilities; 2) acquires advanced C-band and S-band active electronically scanned array (AESA) radars with variable and reprogrammable multi-threat capabilities to better represent modern, complex EW test and training environments; 3) delivers and integrates C/X-band auxiliary systems necessary to simulate threat-representative integrated air defense system laydowns; 4) acquires modern, upgraded ground-based threat emulators (low, mid, and high-band) for USAF and Navy test ranges to enable realistic operational testing of F-35 and other airborne electronic attack platforms; 5) develop and fields mobile telemetry systems supporting long-range testing over the open ocean; 6) dynamic beam control measurement system for assessing performance of high energy laser (HEL) systems mounted on moving platforms in realistic shipboard and ground vehicle environments; 7) develop and fields an instrumented surrogate cruise missile target for the test and evaluation of directed energy engagements; 8) Upgrades portable broad open-ocean scoring system to include telemetry and SATCOM relay capability. FY 2023 funding increase reflects additional capabilities to the program in several high priority areas including: 1) acquisition of multiple advanced X-Band and VHF/UHF electronic warfare threat simulators to represent modern, complex EW test scenarios; 2) improve test capabilities at WSMR to evaluate impact of space environment and nuclear effects on microelectronics in realistic, controllable conditions; 3) broad ocean area RF and optical scoring capabilities to test lethality and impact location of hypersonic weapons in both Atlantic and Pacific oceans; 4) modernization of high speed test track at Holloman AFB and upgrades to tracks at China Lake and Eglin for testing hypersonic weapons; and 5) high-bandwidth, high-speed telemetry instrumentation at Kwajalein to enable high-speed data collection and fast turnaround of test data for hypersonic testing. FY 2023 decrease of \$38M reflects transfer of funds to USAF for MILCON associated with high capacity mid-pressure arc heater development at Arnold Engineering Development Complex, TN.						

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0604940D8Z / Central Test and Evaluation Investment Program (CTEIP)				Project (Number/Name) 940 / Central Test and Evaluation Investment Program (CTEIP)			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
940: Central Test and Evaluation Investment Program (CTEIP)	2,014.894	407.678	994.151	819.358	-	819.358	834.052	789.225	550.279	457.466	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Central Test and Evaluation Investment Program (CTEIP) develops critically needed, high-priority Test and Evaluation (T&E) capabilities for joint/multi-Service requirements. CTEIP efforts include Hypersonics, Directed Energy, Cyber, Electronic Warfare, Nuclear Effects, Space, Autonomy and Multi-Domain Operations. Other Investments in test infrastructure align with objectives in the Strategic Plan for DoD T&E Resources for high priority test needs and common range Infrastructure.

The CTEIP uses a corporate investment approach to combine T&E needs from Service, Defense, and other Government agencies in order to maximize opportunities for joint efforts and avoid unwarranted duplication of test capabilities. CTEIP evaluates and selects for execution, proposals that align to the NDS and USD(R&E) priorities, provide the greatest return on investment, make efficient use of limited test resources, leverage Service investment; and promote joint solutions to fill test capability gaps. CTEIP provides enterprise solutions that benefit the Department as a whole.

The CTEIP provides critically needed T&E investments which align to USD(R&E) priorities and the Strategic Plan for DoD T&E Resources. These investments are needed so that test capabilities keep pace with U.S. and adversary technical advances as well as with quickly changing threats. The CTEIP includes special studies, analyses, project improvements, quick reaction efforts and strategic planning related to test capabilities and infrastructure. CTEIP investments increase efficiency and reduce the cost of testing on DoD's major ranges and test facilities. CTEIP continues to serve as the focal point for fostering common architectures throughout the test and training communities to enhance the sharing of resources and linkages between test and training ranges.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Central Test and Evaluation Investment Program	407.678	994.151	819.358
Description: Autonomous Systems Test Capability develops a Digital Robotic and Autonomous Systems Integrated Virtual Environment (DRIVE) for testing DoD autonomous ground vehicle systems and an open-air range Safety Environment, Engagement and Response (SEER) capability to safely test full scale autonomous vehicles.			
Autonomy Integration and Teaming develops a suite of capabilities furthering UAS systems integration into controlled airspace and the test tools for integrating manned-unmanned teaming between ranges. Early demonstration at Pax River, MD has been successful. Initial capabilities will be delivered to NAS Pax River, MD, Redstone Arsenal, AL and Edwards AFB, CA.			
Counter UAS Lethality Diagnostics will provide a shielded enclosure for flight controllers, lethality and HPM diagnostics for cUAS operations.			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Counter UAS develops a prototype high-fidelity X-band radar for tracking cUAS capabilities against commercially available small UAS. This provides a Common Operating Picture system for real-time awareness, data collection and analysis.				
Counter UAS Jamming Operations develops an open-air capability for creating a mission relevant RF test environment for testing CUAS systems at NAWCAD Webster Field, MD.				
Naval Autonomous Systems Test Capability establishes an M&S capability to test the performance of Naval surface ship autonomous systems software.				
Advanced Range Tracking and Imaging System develops the next generation suite of optical tracking systems to increase performance, reduce costs and establish secure reliable optical tracking capability on DoD open-air ranges.				
Short-Wave Infrared Zoom Lens develops a short-wave IR metric zoom lens to be mounted on multiple DoD tracking systems to track, determine effects phenomenology, and TSPI of aerial directed energy targets at night and in obscuration.				
Common Vehicle and Engagement Real-Time Test Instrumentation will reduce the size, weight and power for vehicle test data collection by replacing three unique data collectors with one modular, scalable data collector with increased storage capacity. This capability supported Abrams M1A2 System Enhancement Package (SEP) V3 and Bradley M2/M3A4 FOT&E and will support future vehicle tests.				
Hybrid Tracking System will develop a modular system of sensors to provide a range of capabilities for providing time, space position information, in GPS denied environments, for aircraft and weapon testing.				
Joint Standard Instrumentation Suite (JSIS) Phase 2 acquires a missile attitude instrument suite used to capture 6-DOF TSPI and validate RF and IR missile models, while meeting requirements associated with OCONUS transport and operation.				
Littoral Electromagnetic Range establishes a secure, well-instrumented coastal test environment at NIWC, San Diego to validate emerging commercial and government electromagnetic systems and tactics.				
Maritime Tomahawk Range Safety Upgrade provides an additional telemetry frequency to Block V Tomahawk test assets enabling range safety control and telemetry in support of stream raid/simultaneous engagements.				

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B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Open-Air Multi-Spectral Data Collection develops a test capability for T&E of integrated multi-spectral threat warning receivers and infrared countermeasures against complex multi-spectral threats. This effort will field co-located RF and IR mobile threat simulators and a portable C2 node for realistic threat presentation to engage the SUT.					
Over Water Impact and Location Scoring System develops an open ocean weapons impact scoring system to provide persistent, relocatable range capability for beyond line of sight, high precision weapon scoring and range surveillance.					
Directed Energy High Speed Data Recorder develops a ruggedized, shielded, man-portable high-speed data recording system for HPM directed energy testing.					
Government Radiometrically-Accurate Instrument for Laser Evaluation develops a diagnostic system for confirming performance of current and future HEL systems.					
Directed Energy Remote Target Status Sensor develops a system capable of measuring HPM effects on internal components attacked by HPM systems.					
Directed Energy S-Band Threat Source develops a frequency agile S-band HPM threat source for MIL-STD 464C vulnerability testing.					
Directed Energy Tethered HPM Recorder and Electronic Attack Target effort accelerates development of instrumentation necessary for testing UAS vulnerabilities in an HPM threat environment.					
Directed Energy System Placement Analysis Tool upgrades existing capability to provide 3D outdoor effects test planning tool with safety assessments needed to support testing of Counter UAS HPM systems.					
HPM E-Field Sensor develops a portable wide area measurement system to characterize the HPM E-field and test blue HPM effectiveness against airborne threats.					
HPM VHF Threat Simulator develops a test source to support wideband VHF MIL STD 464C testing of a full-sized target such as an aircraft.					
Closed Loop PESA Simulator develops two transportable, closed-loop threat radar systems replicating the performance of a classified, widely fielded long-range surface-to-air missile system.					

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
EO/IR direct injection will develop test capability in which EO/IR imagery is directly injected into the systems' core computer via sensor emulators.			
Electronic Attack Drone for Army T&E develops a package for BQM-167 drone target that can target multiple radar systems under test (SUT)s at multiple frequency bands.			
IADS Enhancements and Networked Threat Emulation develops a comprehensive threat-representative IADS capability at Electronic Combat Range, China Lake and other facilities providing four threat-representative Command Posts to existing EW capabilities.			
Interactive CNI RF Environment Simulator will address ISTF shortfalls in CNI RF testing on modern aircrafts by expanding upon current ISTF capability to provide an operationally relevant ground test environment.			
Joint Electronic Warfare Cyber Techniques, Effects and Characteristics development provides an RF and cyber effects test environment for Electromagnetic Maneuver Warfare.			
Joint Electronic Warfare Airborne Instrumentation Interoperability development was initiated to maximize airborne instrumentation interoperability between the CTEIP developed Common Range Integrated Instrumentation Systems and Air Force/Navy Tactical Combat Training System II, and established a blueprint for merging baselines into a common system. Development will continue from FY 2021-2026 which includes upgrading CRIIS encryption to NSA requirements as well as data link and ground software upgrades to increase interoperability between CRIIS and TCTS-II on test and training ranges.			
Joint Electronic Warfare DIADS Integration upgrades DIADS M&S capacities to support expansion of EW testing across western test ranges.			
Joint Electronic Warfare Open Air Battle Shaping will establish an enterprise architecture and approach to implement multi-range aircraft instrumentation interoperability and network connectivity to meet test and training needs for air warfare missions. This includes upgrading aircraft instrumentation and multi-range aircraft compatibility and simulated effects needed to provide enlarged, realistic, interoperable battlespace as aircraft transit multiple ranges during a large-scale test and training scenario.			
Radar Air-to-Ground Environment will develop capabilities for testing high-density air-to-air, air-to-ground,) and advanced signals (AS) in an ISTF environment. The radar environment simulator will provide digital RF memory devices that capture, store, delay, scale, and return radar signals to the radar under test.			

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B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Ultra-Low Band Time Difference of Arrival (provides Next-Generation Electronic Warfare Environment Generator hardware to enable multi-ship correlation of simulated signals to a specific emitter or emitters.					
Hypersonic Test Capability Improvement develops a clean air, variable Mach ground test capability from Mach 4 to Mach 6 for DT&E of full-scale hypersonic boost glide and scramjet weapon systems. Procurement and detailed design continued in FY 2021.					
Mid-Pressure Arc Heater development expands the DoD H2 Hypersonic Test Facility to provide higher enthalpy at the mid-pressure altitudes to enable ground testing of Prompt Global Strike, Maneuvering Reentry Vehicles, and SCRamJet components such as nose cones, fins, and other leading-edge surfaces.					
The next generation aeroshell test capability develops an arc heater facility that increases DoD's capacity to conduct aerothermal materials testing in support of hypersonic missiles, ballistic missiles, and other high altitude ballistic/maneuvering munitions. The system will more than double the annual test capacity.					
G-Range Weather Effects upgrades the current test track to provide a small-scale rain and snow erosion test capability to validate vehicle structural design.					
High Energy Laser Dynamic Environment develops 6 DoF vibration tables for HEL systems mounted on ships, ground vehicles, and aircraft.					
High Pressure Air Compressor provides additional air compressor capability at AEDC to reduce recharge time resulting in more test runs per week at the Aerodynamic and Propulsion Test Unit and J5.					
Joint Economical Sled Track Rocket develops a new modular rocket propulsion system for the three DoD high speed test tracks including an improved capability to ground test full scale components at hypersonic speeds.					
Diagnostic Scoring System (Radar on a Raft) Motion Compensation develops a radar pedestal motion compensation mechanism and test and verification system to support weapon lethality testing in broad open ocean environments.					
Mach 7 test capability at the AEDC tunnel 9 return to service provides a full-scale aerothermal structural capability for seeker aperture development.					
M&S for Maneuvering Boost Glide Vehicles - Transient Thermal Analysis Software upgrades a tool set improving capabilities for predicting aerothermal and ablation response to high speed, high temperature flow in ground and flight test environments.					

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B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
M&S Enhancements Weather Effects develops advanced material response models validated with ground test data to predict weather erosion in flight.					
Reconfigurable RF Target Simulator upgrades an Eglin AFB facility to test prototype sensors in a simulated hypersonic target and scene environment.					
Reagan Test Site Non-Ballistic Radar Tracking develops advanced, non-ballistic tracking algorithms and the supporting infrastructure to track non-ballistic hypersonic vehicles.					
Reagan Test Site Kiernan Reentry Measurements Site Technology Refresh will refresh KREMS Radar hardware and software systems to increase system functionality and system capability.					
Accelerated Vehicle Durability Testing develops a multi-axle vehicle chassis simulator and a drive train simulator to test heavy 4 and 5 axle vehicle performance and reliability.					
Radar Cross Section Range Relevance is comprised of eleven development efforts providing upgraded and new RCS measurement capabilities to measure and evaluate advanced low observable technologies in increasingly complex and cluttered environments.					
Scene Projector will improve high fidelity, high temperature scene protectors for installed system and hardware in the loop laboratory testing of sensors and seekers for high speed weapons and missile engagements.					
Dense Plasma Focus develops an ultra-short pulse simulation capability to test the vulnerability of missile components to very short, intense bursts of neutrons from a fusion-based nuclear weapon.					
Fast Burst Reactor Upgrade develops new high purity, high enriched uranium rings and safety blocks for the fast burst reactor at White Sands Missile Range, NM to conduct neutron vulnerability testing of missile and other components.					
Heavy Ion Test Facility Upgrade for Single Event Effects (SEE) testing. A Single Event Effects (SEE) adds an additional SEE Beamline to increase capacity of testing natural space radiation.					
White Sands Test Center Survivability and Vulnerability Rarefaction Waveform Eliminator Upgrade provides an improved louver system for the large blast simulator to prevent debris hitting the test object.					

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B. Accomplishments/Planned Programs (\$ in Millions)								
<p>White Sands Test Center Survivability and Vulnerability Xenon Lamp Facility Upgrade provides an improved control system and subsonic wind capability for this system.</p> <p>X-Ray Simulator for Test and Evaluation of Nuclear Survivability replaces and upgrades three DoD X-ray simulators that measure the susceptibility of missile components to damage from high dose warm and cold x-rays experienced in space.</p> <p>Advanced Communication Threat Testing Suites Uplink Capability develops an EW threat representative uplink jamming system for T&E of satellite system responsiveness against threat systems.</p> <p>General Threat Torpedo develops a threat representative torpedo vehicle that tactically and acoustically emulates threat torpedoes that are not currently available for surface or sub-surface ship testing.</p> <p>IR and RF Threat M&S upgrades 10 RF and 10 IR authoritative Intelligence Community missile models supporting the DoD Threat Model Analysis Program (TMAP), Enhanced Missile SIGnature (EMSIG) and other high-fidelity seeker models.</p> <p>Maritime Survivability Library Threat M&S Tool evaluates the lethality of emerging anti-ship weapons, using artificial intelligence/machine learning techniques.</p> <p>Multispectral Sea and Land Target Simulator Emitter Upgrades modernizes IR Missile plume simulator emitters to meet current and future systems' fidelity requirements, as well as improve the simulators' availability and sustainability replacing obsolete equipment and augmenting the available standby emitters.</p> <p>Towed Array Threat Emulator (TATE) Threat Representation will provide a modular towed array/architecture to add to the Submarine Launched Countermeasure Emulator for full duplex submarine countermeasure testing.</p> <p>Tactical Aerospace Laser Optical Simulator – High Altitude will develop a dual laser threat simulation capability to evaluate space-based ISR sensors against surrogate ground- and air-based laser threats.</p> <p>Adaptable Multi-Band Asset for Global Navigation Satellite System develops a threat representative multi-modal global navigation satellite system jammer to provide denial and deception jamming of PNT information during operational test and training.</p> <p>Army Threat Force Geospatial System completes development of the Common Operational Picture system for management of Threat Force assets.</p>		<table border="1"> <thead> <tr> <th>FY 2021</th> <th>FY 2022</th> <th>FY 2023</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>	FY 2021	FY 2022	FY 2023			
FY 2021	FY 2022	FY 2023						

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B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>Electronic Attack-5G development provides a threat representative Electronic Attack capability against 5G systems for denial, degradation and deception of service attacks during operational test and training.</p> <p>Towed Airborne Plume Simulator Helicopter will provide an infrared threat missile plume-simulator to support rotary wing Aircraft Survivability.</p> <p>Cyber Test Tools</p> <ul style="list-style-type: none">* Avionics Test Bed 2.0 develops a common framework to allow embedded avionics components to engage in an error-free state while component level cybersecurity T&E is performed.* Bindle Linux Harness Automation automates the construction of harnesses that the fuzzer can then use to launch and feed inputs to a Linux based system under test.* Full Authority Digital Engine Control (FADEC) Tool develops a test bench and cyber tools to assess the cyber vulnerabilities of the main communication and control channels and data links.* Network, System Integration and Test Environment Cyber Test Capabilities expands the NSITE application to include cyber capabilities to monitor, check for, alert on, identify messaging, and identify the source of the messaging that is modified, or indicates a modification “tip-off” capability.* Non-IP Cybersecurity Suite will provide a Non-IP threat attack tool suite for Navy vessel cyber testing. <p>FY 2022 Plans:</p> <p>Autonomous Systems Test Capability will complete development in FY 2022 and IOC in FY 2023. ASTC will enable evaluation of autonomy software in a distributed M&S environment and will provide an instrumented open air range to validate algorithm performance.</p> <p>Autonomy Integration and Teaming capability will IOC in FY 2022 providing instrumented open air test ranges at Pax River, Redstone Arsenal, and Edwards AFB to test Detect and Avoid technologies and evaluate the ability of unmanned aircraft operation in and traverse civil airspace.</p> <p>Counter UAS jamming environment for maritime operations will IOC in FY 2022. This capability will produce threat realistic electromagnetic and EW environments at St. Inigoes for testing CUAS in littoral and maritime environments.</p> <p>Advanced Range Tracking and Imaging System capability will IOC at WSMR. This capability will replace aging and obsolescent optical tracking capabilities at multiple Service test ranges.</p>					

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
Short-Wave Infrared Zoom Lens capability will FOC in FY 2022. This capability will augment ARTIS and enable EO/IR tracking in adverse weather condition and during night operations.			
Common Range Integrated Instrumentation System will continue compatibility/interoperability initiatives with the Tactical Combat Training SystemII. CRIIS is the underlying architecture being used by TCTS-II. This effort will ensure test and training ACMI systems can operate on one another's ranges.			
Joint Standard Instrumentation Suite Phase 2 will achieve IOC in FY 2022 enabling high accuracy, 6-DOF measurements of threat missile characteristics in-flight. This data is necessary to validate IR and RF threat models being developed for our HWIL and OAR threat simulators.			
Over Water Impact and Location Scoring System will IOC in FY 2022. OWIL will enable broad open area ocean scoring of conventional and hypersonic missile impacts.			
Directed Energy High Speed Data Recorder will IOC in FY 2022. DEHSDR will provide man portable, ruggedized data recorders to capture RF data in HPM environments.			
Government Radiometrically-Accurate Instrument for Laser Evaluation capability will IOC in FY 2022. This capability will enable HEL programs and tech demonstrators to evaluate laser performance (power, beam size, near-field irradiance, etc.) in a controlled environment.			
Directed Energy Remote Target Status Sensor will IOC in FY 2022 providing an ability to remotely assess and report the functional status of electronic response to target engagement when it is unsafe for personnel to be in the target area.			
HPM E-Field Sensor will IOC in FY 2022 enabling remote HPM field data collection and characterization as well as remote data transfer to the base station.			
HPM VHF Threat Simulator will IOC in FY 2022 providing a generic HPM source for testing blue systems against VHF threats.			
Closed Loop PESA Simulator willcomplete FAT and IOC/FOC at Eglin AFB and Nellis Test and Training Range providing first-of-kind operationally realistic threat representations of a classified WESTPAC SAM threat for testing airborne electronic attack platforms. CLPS will IOC at Nevada Test and Training Range in FY 2022.			

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B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>Joint Electronic Warfare DIADS Integration Upgrades (Phase I) will IOC in FY 2022 for Navy Sea and Land Ranges.</p> <p>Many-on-Many EW test capability will begin in FY 2022. This capability will reside within the ACETEF at Pax River, MD and will enable single and multi-ship engagements against dense RF threat environments which cannot be replicated in the open air.</p> <p>Large scale hypersonic full body test capability will complete final design in FY 2022. This facility will enable full-scale ground testing at hypersonic air speeds for extended durations.</p> <p>Mid-pressure Arc Heater complex will test thermal protection systems and materials survivability for hypersonic weapons and is expected to begin and reach PDR in FY 2022. This facility will greatly improve test capacity and enhance the enthalpy envelope with which vehicle testing occurs ultimately providing critical feedback to hypersonic weapon developers.</p> <p>Ground Based Radar Upgrade for key tracking radars at Kwajalein Atoll will deliver the required radome design drawings in FY 2022 to enable fabrication to begin. The radome is critical to keeping this asset operational during the next 4 years as hypersonic testing at RTS increases.</p> <p>G-Range Weather Effects will IOC in FY 2022 enabling AEDC to evaluate effects of rain, sand, and other atmospheric conditions on hypersonic projectiles.</p> <p>High Speed Test Track Weather Effects will conduct full system demonstration runs and IOC in FY 2022. The capability will be implemented on the High Speed Test Track at Holloman AFB and will enable controlled weather effects testing for hypersonic and conventional weapons.</p> <p>Joint Economical Sled Track Rocket capability will be awarded in FY 2022. JESTR is a modular rocket motor development effort to meet ground test propulsion needs for hypersonic weapons testing (both recoverable and impact testing).</p> <p>Diagnostic Scoring System via Radar on a Raft Motion Compensation will complete in FY 2022. This capability will provide motion compensation and stabilization of existing radar trackers to provide more accurate TSPI/tracking of incoming hypersonic weapons.</p> <p>Reagan Test Site Non-Ballistic Radar Tracking capability will IOC in FY 2022. This capability will apply novel tracking software algorithms to existing KREMS radars at RTS to allow tracking of low flying, highly maneuverable hypersonic weapons.</p> <p>Accelerated Vehicle Durability Testing capability will FOC in FY 2022. AVDT will provide a ground based simulator to perform drivetrain and chassis testing on 98% of the DOD's vehicle fleet.</p>					

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>The National RCS Test Facility at WSMR completed the Target Preparation Facility Upgrade and initiated the Target Rollover and Dynamic Signal Processing efforts. These capabilities facilitated quicker test turnaround and safer operations for personnel.</p> <p>White Sands Test Center Survivability and Vulnerability Rarefaction Waveform Eliminator Upgrade will IOC in FY 2022.</p> <p>White Sands Test Center Survivability and Vulnerability Xenon Lamp Facility Upgrade will IOC in FY 2022 increasing coupon size, thermal flux uniformity, and airflow over the test article to enable more accurate testing of electronics exposed to nuclear environments.</p> <p>Advanced Communication Threat Suite for Uplink Jamming Capability will FOC in FY 2022. The capability will enable testing of AEHF and other advanced satellite programs already in orbit by simulating red force jamming signals at non-destructive scaled levels.</p> <p>Ground Unattended Threat Sensor Suite will FOC in FY 2022 providing threat representative ground sensor networks for evaluation of blue force movements and operations in large scale test events.</p> <p>Pulsed Doppler Emitter Capability Payload for Aerial Targets (PDEC-163) develops threat representative pulse doppler emitter packages for GQM-163A supersonic sea-skimming targets. PDEC-163 continued development will achieve IOC by the end of FY 2022.</p> <p>Towed Array Threat Emulator (TATE) Threat Representation will provide a modular towed array/architecture to add to the Submarine Launched Countermeasure Emulator for full duplex submarine countermeasure testing. TATE will achieve IOC in FY 2022.</p> <p>Avionics Test Bed 2.0 will be initiated in FY 2022 and develop a common framework to allow embedded avionics components such as line replaceable units to engage in an operational and error-free state while component level cybersecurity T&E is performed. Planned IOC is FY 2023.</p> <p>Cyber Tools for Aviation Threat Triggers will begin in FY 2022 and develop a cybersecurity test tool for exploiting unencrypted Radio Frequency (RF) datalinks found on various weapon platforms. Planned IOC is FY 2023.</p> <p>Fiber Channel Test Tools are beginning development in FY 2022 and will produce test capability to evaluate vulnerability of weapon system and subsystem data transfer and digital communication channels. Planned IOC is FY 2023.</p>			
			FY 2023

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Linkjacker will begin in FY 2022 and develop cybersecurity test tools for exploiting unencrypted RF datalinks currently being used on multiple platforms. Planned IOC is FY 2023.				
Network, System Integration and Test Environment will begin development in FY 2022 and deliver ubiquitous cyber test tools to evaluate LINK-16 performance in contested environments. Planned IOC is FY 2023.				
FY 2023 Plans: Joint EW Dominance capability to acquire multiple advanced X-Band and VHF/UHF electronic warfare threat simulators to faithfully represent modern, complex EW test scenarios and provide necessary threat density. Deliver and integrate threat representative open and closed loop capabilities at the Joint Pacific Alaska Range Complex, Nellis Test and Training Range, China Lake, and Point Mugu to enable evaluation of advanced airborne electronic attack platforms and electronic support aircraft including F-35, EA-18G, F/A-18, NGJ, B-1, B-2, and B-21.				
Capability to test and evaluate vulnerability and susceptibility of microelectronics to effects encountered in nuclear and space environments. Test capability will develop and field instrumentation to simulate realistic neutron and gamma environments in a controlled environment.				
Transportable instrumentation suite to assess lethality and determine terminal area scoring location and profile of hypersonic weapons in the broad open area ocean. Capability will be capable of operating in both Pacific and Atlantic oceans.				
Develop and build next generation sled track at Holloman AFB to enable controlled, repeatable, and recoverable testing of hypersonic weapons (Mach 5+). Capability will install over 9 miles of 3-rail sled track and will extend current water trays to enable safe recovery of test vehicles. Effort will also make necessary spot repairs at China Lake SNORT test track and Eglin high speed test track to ensure additional capacity for all weapon testing.				
Secure Telemetry and High-bandwidth Data Processing will enable near-real time telemetry collection and data distribution for hypersonic weapon endgame testing. SATCOM and ground-based TM networks will be installed at Reagan Test Site (Kwajalein Atoll) as well fiber connectivity between data collection sites at individual islands around the atoll. Capability will enable immediate collection and processing of data from the test vehicle and will result in vastly improved turnaround time for test results.				
FY 2022 to FY 2023 Increase/Decrease Statement: The TRMC initiated a transfer of CTEIP funding to AF MILCON to jump-start building a critical aeroshell test facility for hypersonics, missile defense, and strategic systems at Arnold AFB, TN, starting in FY 2023.				

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>FY 2023 funding increase reflects improving the Department's test infrastructure to support testing in several high priority areas which include:</p> <p>(1) Joint Electronic Warfare Dominance Test Infrastructure – acquiring multiple threat-representative wideband radars to adequately test and assess our fifth-generation aircraft in a contested environment.</p> <p>(2) DoD Microelectronics Ecosystem – hardening our next generation of microelectronics for survivability against nuclear effects (neutrons, x-ray, gamma, etc.) on the battlefield, and accelerate the testing of microelectronics used in strategic systems and space systems.</p> <p>(3) Flight Test Instrumentation and Terminal Area Scoring – broad ocean area precision scoring capabilities to test lethality and impact location of nuclear modernization systems (Ground Based Strategic Deterrent, Trident, etc.).</p> <p>(4) High Speed Test Track – upgrading capabilities to realistically test end-game missile lethality (seeker, warhead detonation, intercept effectiveness, etc.) at DoD high speed test tracks which are located at Holloman, China Lake, and Eglin.</p> <p>(5) Secure Telemetry and High Bandwidth Data Processing – improving cybersecurity and accelerating test analysis at numerous long-range missile test ranges to support faster acquisition of hypersonic and nuclear modernization systems.</p>			
Accomplishments/Planned Programs Subtotals		407.678	994.151
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support</i>	PE 0604942D8Z / <i>Assessments Evaluations</i>											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	29.002	18.296	17.879	4.607	-	4.607	4.524	4.640	4.579	4.567	Continuing	Continuing
822: <i>Director, Special Programs (DSP)</i>	6.465	5.196	4.579	4.607	-	4.607	4.524	4.640	4.579	4.567	Continuing	Continuing
823: <i>National Assessment Group (NAG)</i>	22.537	13.100	13.300	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program is reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress. For further information, please contact the Director of Special Programs, OUSD(A&S)/DSP.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	18.368	17.980	0.000	-	0.000
Current President's Budget	18.296	17.879	4.607	-	4.607
Total Adjustments	-0.072	-0.101	4.607	-	4.607
• Congressional General Reductions	-	-0.101			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.072	-			
• Adjustments to Budget Year	-	-	4.607	-	4.607

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0604942D8Z / <i>Assessments Evaluations</i>				Project (Number/Name) 822 / <i>Director, Special Programs (DSP)</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
822: <i>Director, Special Programs (DSP)</i>	6.465	5.196	4.579	4.607	-	4.607	4.524	4.640	4.579	4.567	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification Classified Program.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: Director, Special Program Description: Detailed Information is Classified. FY 2022 Plans: Detailed information is Classified. FY 2023 Plans: Detailed information is Classified. FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023									5.196	4.579	4.607	
Accomplishments/Planned Programs Subtotals									5.196	4.579	4.607	
C. Other Program Funding Summary (\$ in Millions) N/A Remarks D. Acquisition Strategy N/A												

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0604942D8Z / <i>Assessments Evaluations</i>				Project (Number/Name) 823 / <i>National Assessment Group (NAG)</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
823: <i>National Assessment Group (NAG)</i>	22.537	13.100	13.300	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification Classified program.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: National Assessment Group (NAG) Description: Detailed information is Classified. FY 2022 Plans: Detailed information is Classified. FY 2023 Plans: Detailed information is Classified. FY 2022 to FY 2023 Increase/Decrease Statement: Reduction from FY 2022 to FY 2023 is due to mission and funds being realigned to DTRA.									13.100	13.300	0.000	
Accomplishments/Planned Programs Subtotals									13.100	13.300	0.000	
C. Other Program Funding Summary (\$ in Millions) N/A Remarks D. Acquisition Strategy N/A												

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support	R-1 Program Element (Number/Name) PE 0605100D8Z / Joint Mission Environment Test Capability (JMETC)
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	434.042	76.146	71.410	126.079	-	126.079	187.421	195.786	198.188	195.534	-	-
087: JMETC Distributed Test	212.641	31.136	13.505	53.403	-	53.403	114.899	124.752	125.855	122.255	-	-
088: JMETC National Cyber Range (NCR) Complex	221.401	45.010	57.905	72.676	-	72.676	72.522	71.034	72.333	73.279	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to defend the homeland, deter strategic attacks and aggression while prevailing in conflict, building enduring advantage, and building a resilient Joint Force and defense ecosystem. The Joint Mission Environment Test Capability (JMETC) program provides a Department of Defense (DoD) enterprise-wide test capability to support system-to-system interoperability testing, mission-level environment testing, and cyber event operations, including cyber testing, cyber training, cyber experimentation, and cyber mission rehearsal. The JMETC program implements the infrastructure capabilities defined in the DoD "Testing in a Joint Environment Roadmap" to provide acquisition program managers a robust nation-wide capability to "test like we fight". The JMETC program provides a persistent, distributed test and evaluation (T&E) capability that supports system development to measure and improve interoperability performance and cyber resiliency, which otherwise would not be readily available to Service/Component acquisition programs. The JMETC program is funded within the Research, Development, Test and Evaluation (RDT&E) Management Support Budget Activity because it provides test capability in support of RDT&E programs. By linking distributed facilities, as well as providing the necessary tools, services and subject matter expertise, the JMETC program allows acquisition programs to efficiently evaluate their warfighting capability in a realistic joint mission environment. The JMETC program has been aligned to advance the National Defense Strategy (NDS), to test the development of resilient, survivable, federated networks and information ecosystems from the tactical level up to strategic planning, as well as test and assess cyber defenses, building a more lethal force.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support	R-1 Program Element (Number/Name) PE 0605100D8Z / Joint Mission Environment Test Capability (JMETC)
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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	76.146	71.410	0.000	-	0.000
Current President's Budget	76.146	71.410	126.079	-	126.079
Total Adjustments	0.000	0.000	126.079	-	126.079
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustment	-	-	-1.601	-	-1.601
• Test and Resource Management Center	-	-	32.024	-	32.024
Multi-Domain Testbeds					
• Joint Artificial Intelligence Test and	-	-	8.940	-	8.940
Evaluation Infrastructure Capability					
• Budget Year Adjustment	-	-	86.716	-	86.716

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

FY 2023 increase reflects funding to 1) accelerate implementation and testing of Joint All Domain Command and Control (JADC2) and the testing of kill webs, and 2) testing the cyber vulnerabilities and integration of trusted artificial intelligence (AI) and autonomous systems in partnership with the Joint Artificial Intelligence Center.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605100D8Z / Joint Mission Environment Test Capability (JMETC)				Project (Number/Name) 087 / JMETC Distributed Test			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
087: JMETC Distributed Test	212.641	31.136	13.505	53.403	-	53.403	114.899	124.752	125.855	122.255	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Joint Mission Environment Test Capability (JMETC) program provides a Department of Defense (DoD) enterprise-wide test capability to support system-to-system interoperability testing, mission-level environment testing, and cyber event operations, including cyber testing, cyber training, cyber experimentation, and cyber mission rehearsal. The JMETC program implements the infrastructure capabilities defined in the DoD "Testing in a Joint Environment Roadmap" to provide acquisition program managers a robust nation-wide capability to "test like we fight". The JMETC program provides a persistent, distributed test and evaluation (T&E) capability that supports system development to measure and improve interoperability performance and cyber resiliency, which otherwise would not be readily available to Service/Component acquisition programs. The JMETC program is funded within the Research, Development, Test and Evaluation (RDT&E) Management Support Budget Activity because it provides test capability in support of RDT&E programs. By linking distributed facilities, as well as providing the necessary tools, services and subject matter expertise, the JMETC program allows acquisition programs to efficiently evaluate their warfighting capability in a realistic joint mission environment. The JMETC Program has been aligned to advance the National Defense Strategy (NDS), to test the development of resilient, survivable, federated networks and information ecosystems from the tactical level up to strategic planning, as well as test and assess cyber defenses, building a more lethal force.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: JMETC Distributed Test	31.136	13.505	53.403
<p>Description: The JMETC Distributed Test project continued expansion of the JMETC Secret Network (JSN) infrastructure to meet requirements. The JMETC Distributed Test project supported DoD distributed test and training events to include: system interoperability certification; system interoperability assessments; command and control systems; air and missile defense; 4th and 5th Generation Aircraft; unmanned aircraft; precision-guided bombs; munitions; missile tracking and guidance; infrared countermeasures; Joint Fires; Joint Close Air Support; and coalition exercises.</p> <p>The JMETC Distributed Test project provided test planning support to users and organizations to conduct interoperability testing on numerous DoD systems including: command and control systems; information warfare; air and missile defense; intelligence, surveillance, and sensor systems; surface ships; anti-surface warfare; anti-submarine warfare; tactical radar systems; precision-guided bombs; unmanned aircraft; autonomous aircraft; manned fixed wing aircraft; helicopters; and enterprise information systems.</p> <p>The JMETC Distributed Test project assisted customers with the use of distributed test tools and troubleshooting of the end-to-end network infrastructures. In addition, the JMETC team provided on-site support for the execution of large-scale, complex distributed events.</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605100D8Z / <i>Joint Mission Environment Test Capability (JMETC)</i>	Project (Number/Name) 087 / <i>JMETC Distributed Test</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>The JMETC Distributed Test project continued to develop post-test enterprise service capabilities, to include Knowledge Management and Big Data Analytics tools and technologies, in support of JMETC customer needs and requirements. The JMETC Distributed Test project released a common data analytics framework (CHEETAS) that reduces data access time from weeks to hours and enables big data analytics, data mining, and machine learning application for large T&E data sets.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> - The JMETC Distributed Test project will continue to optimize the JMETC Secret Network (JSN) infrastructure to meet requirements. - The JMETC Distributed Test project will continue supporting DoD distributed test and training events. - The JMETC Distributed Test project will continue providing test planning support to users and organizations to conduct interoperability testing on numerous DoD systems. - The JMETC Distributed Test project will continue to assist customers with the use of distributed test tools and troubleshooting of the end-to-end network infrastructures. Initial T&E tools will be developed as a service offering in the GovCloud. In addition, the JMETC team will provide on-site support for the execution of large-scale, complex distributed events. - The JMETC Distributed Test project will continue to provide updated Big Data Analytics tools and technologies, in support of JMETC customer needs and requirements. An updated CHEETAS analytics capability will be released, including a DoD Analytics "App Store" for technical data. The expansion of T&E as a Service in the GovCloud will continue. - The JMETC Distributed Test project will continue to support new and emerging acquisition programs. <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - The JMETC Distributed Test Project will initiate the establishment of an All-Domain Test Range to meet the joint test and evaluation needs of the Services and the in-theater experimentation campaign needs of the Combatant Commands. - The JMETC Distributed Test Project will initiate transition of a DARPA capability for testing simulated and live fielded weapon systems from all operational domains together in a common, distributed environment to evaluate and integrate new joint command and control (C2) systems, novel operational concepts, experimental weapon systems and capabilities. - The JMETC Distributed Test Project will initiate expansion of existing RDT&E networks across the DoD to meet new in-theater test and experimentation needs. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 6		R-1 Program Element (Number/Name) PE 0605100D8Z / <i>Joint Mission Environment Test Capability (JMETC)</i>		Project (Number/Name) 087 / <i>JMETC Distributed Test</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> - The JMETC Distributed Test Project will initiate a reference implementation of Modular Open Systems Architecture and data-centric approaches to C2 both to enable testing new versions of those standards as well as to serve as the test repository for universal C2 interfaces. - The JMETC Distributed Test project will continue to optimize the JMETC Secret Network (JSN) infrastructure to meet requirements, adding or removing sites as necessary. - The JMETC Distributed Test project will continue supporting DoD distributed test and training events. - The JMETC Distributed Test project will continue providing test planning support to users and organizations to conduct interoperability testing on numerous DoD systems. - The JMETC Distributed Test project will continue to assist customers with the use of distributed test tools and troubleshooting of the end-to-end network infrastructures, to include continued expansion of T&E tools as a service in the GovCloud. In addition, the JMETC team will provide on-site support for the execution of large-scale, complex distributed events. - The JMETC Distributed Test project will continue to modernize post-test enterprise service capabilities, to include Knowledge Management and an enterprise framework for updated Big Data Analytics tools and technologies, in support of JMETC customer needs and requirements. - The JMETC Distributed Test project will initiate the development of a federated enterprise T&E data repository to support the evaluation of large data sets, including Artificial Intelligence (AI) data. The JMETC Distributed Test project will also initiate the build out of digital engineering tools and infrastructure to support the development of multi-Service, modernized warfighting capabilities in a digital environment, to include digital engineering infrastructure to support AI development. - The JMETC Distributed Test project will continue to support new and emerging acquisition programs. <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 increase to address all-domain, joint C2 test, experimentation, and integration infrastructure, along with multi-Service artificial intelligence digital engineering infrastructure and enterprise data repository needs.</p>					
Accomplishments/Planned Programs Subtotals			31.136	13.505	53.403

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605100D8Z / <i>Joint Mission Environment Test Capability (JMETC)</i>	Project (Number/Name) 087 / <i>JMETC Distributed Test</i>
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605100D8Z / Joint Mission Environmen t Test Capability (JMETC)				Project (Number/Name) 088 / JMETC National Cyber Range (NCR) Complex			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
088: JMETC National Cyber Range (NCR) Complex	221.401	45.010	57.905	72.676	-	72.676	72.522	71.034	72.333	73.279	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The National Cyber Range Complex (NCRC) is comprised of cyber ranges and a secure distributed network infrastructure to service the cyber range user community. The NCRC currently consists of five functional cyber ranges, including the National Cyber Range in Florida as well as four Regional Service Delivery Points (RSDP) located in Hawaii, Alabama, Maryland, and Massachusetts. To enhance DoD cyber range test and training capability and capacity, the NCRC is being expanded with additional cyber ranges co-located with key Service organizations to support an increase of cyber testing of DoD systems as well as training of cyber warfighters. The JMETC Multiple Independent Level of Security (MILS) Network (JMN) currently links 67 sites across the DoD, industry, and academia, providing secure access between cyber ranges, laboratories, and facilities. Both the cyber ranges and the network infrastructure are accredited to support multiple levels of security classifications, specifically configured to meet particular cyber event requirements. The NCRC investments have been aligned to support the National Defense Strategy in improving cyber defense, cyber resilience, cyber lethality, and the continued integration of cyber capabilities into the full spectrum of military operations.

The NCRC conducts cyberspace test and training events for the full spectrum of DoD customers including research, development, acquisition, testing, training and operational Cyber Mission Forces (CMF). The NCRC executes wide variety of event types including science and technology (S&T) demonstrations, developmental test and evaluation (DT&E), operational test and evaluation (OT&E), security controls assessments, capability assessments, cyberspace operations training, development and refinement of cyberspace tactics, techniques, and procedures (TTP), cyber forensics/malware analysis) and cyberspace operations mission rehearsal. The NCRC enables acquisition programs to conduct cybersecurity test and evaluation in an operationally representative cyberspace environment enabling identification, validation and mitigation of vulnerabilities. The NCRC also supports training, mission rehearsal and certification of the CMF in support of US Cyber Command by enabling operational forces to efficiently evaluate cyber warfighting capability in a realistic joint mission environment to include bi-lateral and multi-national exercises.

The NCRC provides secure facilities, technology, processes, and workforce to rapidly create hi-fidelity, mission-representative friendly, neutral, and adversarial cyberspace environments.

The NCRC also facilitates integration of distributed organizations with different missions and workforce relevant to cyber operations (e.g., cyber operators, penetrations testers, cyber assessors, cyber observers, cyber analysts, etc.). The NCRC supports cyber activities across of a full spectrum of DoD systems, including weapon platforms, C4I systems, business systems, network devices, and other systems vulnerable to a cyber-attack. The NCRC extensively utilizes automation to minimize human error, to reduce the time required to set-up for a cyber event, and to ensure repeatable results. In addition, the NCRC employs post-event sanitization techniques on all assets after exposure to malicious code to restore back to a known, clean state, which allows for reuse in future events. The National Cyber Range Complex (NCRC) is comprised of cyber ranges and a secure distributed network infrastructure to service the cyber range user community. The NCRC currently consists of five functional cyber ranges, including the National Cyber Range in Florida as well as four Regional Service Delivery Points (RSDP) located in Hawaii, Alabama, Maryland, and Massachusetts. To enhance DoD cyber range test and training capability and capacity, the NCRC is being expanded with additional cyber ranges co-located

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605100D8Z / Joint Mission Environment Test Capability (JMETC)	Project (Number/Name) 088 / JMETC National Cyber Range (NCR) Complex		
<p>with key Service organizations to support an increase of cyber testing of DoD systems as well as training of cyber warfighters. The JMETC Multiple Independent Level of Security (MILS) Network (JMN) currently links 67 sites across the DoD, industry, and academia, providing secure access between cyber ranges, laboratories, and facilities. Both the cyber ranges and the network infrastructure are accredited to support multiple levels of security classifications, specifically configured to meet particular cyber event requirements. The NCRC investments have been aligned to support the National Defense Strategy in improving cyber defense, cyber resilience, cyber lethality, and the continued integration of cyber capabilities into the full spectrum of military operations.</p> <p>The NCRC conducts cyberspace test and training events for the full spectrum of DoD customers including research, development, acquisition, testing, training and operational Cyber Mission Forces (CMF). The NCRC executes wide variety of event types including science and technology (S&T) demonstrations, developmental test and evaluation (DT&E), operational test and evaluation (OT&E), security controls assessments, capability assessments, cyberspace operations training, development and refinement of cyberspace tactics, techniques, and procedures (TTP), cyber forensics/malware analysis) and cyberspace operations mission rehearsal. The NCRC enables acquisition programs to conduct cybersecurity test and evaluation in an operationally representative cyberspace environment enabling identification, validation and mitigation of vulnerabilities. The NCRC also supports training, mission rehearsal and certification of the CMF in support of US Cyber Command by enabling operational forces to efficiently evaluate cyber warfighting capability in a realistic joint mission environment to include bi-lateral and multi-national exercises.</p> <p>The NCRC provides secure facilities, technology, processes, and workforce to rapidly create hi-fidelity, mission-representative friendly, neutral, and adversarial cyberspace environments.</p> <p>The NCRC also facilitates integration of distributed organizations with different missions and workforce relevant to cyber operations (e.g., cyber operators, penetrations testers, cyber assessors, cyber observers, cyber analysts, etc.). The NCRC supports cyber activities across of a full spectrum of DoD systems, including weapon platforms, C4I systems, business systems, network devices, and other systems vulnerable to a cyber-attack. The NCRC extensively utilizes automation to minimize human error, to reduce the time required to set-up for a cyber event, and to ensure repeatable results. In addition, the NCRC employs post-event sanitization techniques on all assets after exposure to malicious code to restore back to a known, clean state, which allows for reuse in future events.</p> <p>The NCRC has a multidisciplinary workforce with software, systems, network, virtualization, automation, system administration, and cybersecurity subject matter expertise. In support of successful planning and execution of hosted events, the NCRC workforce helps users define and refine their event objectives, assists with identifying and prioritizing potential vulnerabilities, designs virtualized cyber environments, develops customized traffic generation and instrumentation solutions, integrates 3rd party hardware and software, executes cyber events on behalf of the user, provides cooperative vulnerability and penetration assessments, performs detailed cyber analysis, and delivers detailed reports with actionable information to decision makers. In addition, the NCRC workforce supports both the Executive Agent for Cyber Test Ranges and the Executive Agent for Cyber Training Ranges, to identify and address relevant needs, define and promulgate standards, and seek efficiencies through focused investments.</p>				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Title: JMETC National Cyber Range (NCR) Complex		45.010	57.905	72.676

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 6		R-1 Program Element (Number/Name) PE 0605100D8Z / Joint Mission Environment Test Capability (JMETC)	Project (Number/Name) 088 / JMETC National Cyber Range (NCR) Complex		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>Description: The NCRC continued support for over a hundred cyber events, providing cybersecurity T&E support to Major Defense Acquisition Programs (MDAP), Major Automated Information Systems (MAIS) Acquisition Programs, and smaller acquisition programs, as well as cybersecurity training to multiple COCOMS and Service organizations.</p> <p>The NCRC continued support for cyber testing of systems and subsystems across multiple domains (land, air, sea, and space) relevant to manned and unmanned aircraft, surface ships, command and control systems, data management platforms, weapons platforms, satellites, radars, and missile defense systems.</p> <p>The NCRC continues to support Cyber Table Tops (CTT) which help acquisition programs identify and prioritize potential vulnerabilities for further assessment and mitigation early in the acquisition lifecycle.</p> <p>The NCRC continued support to Service Cyber Mission Forces (CMF) with training, certification, mission rehearsal and TTP development focused events.</p> <p>The NCRC continued support to numerous DoD organizations in cyber activities, including Director, Operational Test & Evaluation (DOT&E); Director, Developmental Test & Evaluation (DT&E); USCYBERCOM; USINDOPACOM; USCENTCOM; US SOCOM; Joint Staff J-7; US Space Force; Defense Intelligence Agency with a host of other intelligence agencies; Army Intelligence and Security Command; Naval Information Warfare Systems Command (NAVWARSYSCOM; Army Cyber Command; Army Cyber National Mission Forces/Cyber Protection Battalions; Naval Information Forces/Fleet Cyber; Naval Air Systems Command (NAVAIR); Naval Sea Systems Command (NAVSEA); Air Force Air Combat Command; Army Space and Missile Defense Command; Army Test and Evaluation Command; Army PEO Aviation; Army PEO Simulation Training and Instrumentation; Navy PEO for Enterprise Information Systems; Navy PEO for Command, Control, Communications, Computers and Intelligence; Navy PEO Ships; Naval Air Warfare Center Training Systems Division; Marine Corps Tactical Systems Support Activity; Naval Criminal Investigative Service; Joint Capability Technology Demonstrations (JCTD); and several partner nations.</p> <p>The NCRC supported the Army's Rapid Cyber Development Environment (RCDN) by dramatically reducing time to put Cyberspace Attack & Enabling Capabilities (CAEC) developed tools into the hands of operators, a critical link in the Cyberspace operations kill chain. The NCRC also addressed Navy cyber test needs by assessing operational impacts of cyber-attacks on manufacturing devices discovered by the vulnerabilities routinely found on the same manufacturing devices. Results from these assessments were used to inform new processes, and to identify operational security (OPSEC), physical security (PHYSEC), and cybersecurity mitigations to secure both Navy manufacturing control systems and associated RDT&E network infrastructure.</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 6		R-1 Program Element (Number/Name) PE 0605100D8Z / <i>Joint Mission Environment Test Capability (JMETC)</i>		Project (Number/Name) 088 / <i>JMETC National Cyber Range (NCR) Complex</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Activities continued to establish new government-controlled cyber range facilities, to include facility conversion work, procurement of computing resources, physical security accreditation, and development of training courseware for utilization of core NCRC cyber range tools by new NCRC workforce members.					
The NCRC continued activities to establish a multi-award IDIQ contract to expand the pool of NCRC contractor workforce members with a diverse set of required knowledge and skills to perform key functions at each NCRC location.					
The NCRC began implementation of an NCRC unclassified (NCRC-U) capability to provide increased access by government, academia, and industry to cyber range resources.					
FY 2022 Plans:					
The NCRC will continue implementing improvements needed to increase capacity to support increased demand at the current and future cyber ranges. The NCRC will continue to build out additional dedicated Persistent Testing and Training Environments to support testing and training customers. This includes newly established NCRC facilities at Central Research Park, Orlando, FL; Joint Base Charleston, SC; and (U) Naval Air Station, Patuxent River, MD (NAVAIR).					
The NCRC will continue to operate in support of the growing acquisition program cybersecurity T&E requirements.					
The NCRC will continue to provide Cyber Table Top support for acquisition programs to help identify and prioritize potential vulnerabilities early in the development lifecycle.					
The NCRC will continue to provide support to US Cyber Command, Joint Staff, and other training and certification events by developing representative blue, red and gray environments.					
The NCRC will continue to support DOT&E cyber assessments.					
The NCRC will continue to support US Cyber Command and other COCOMS with their training, team certification and mission rehearsal activities.					
The NCRC will continue collaboration with Partner Nations by supporting large scale bi-lateral and multi-national training exercises tailored to focus on refinement of joint tactics, techniques and procedures and cyber related operations.					
The NCRC will conduct engineering activities to plan for technical refresh of emerging end of life and end of service computing assets.					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 6		R-1 Program Element (Number/Name) PE 0605100D8Z / Joint Mission Environment Test Capability (JMETC)	Project (Number/Name) 088 / JMETC National Cyber Range (NCR) Complex		
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>The NCRC will continue to assess cyber range requirements in close cooperation with the Executive Agents for Cyber Test Ranges and Cyber Training Ranges to build priority cyber range capability and capacity to meet identified RDT&E community and CMF needs. This includes enhanced knowledge repositories for cyber tools, environments, and threats shared across the DoD acquisition and training community.</p> <p>The NCRC will continue to assist the Executive Agents for Cyber Test Ranges and Cyber Training Ranges to determine requirements and standards needed to integrate these cyber range facilities with existing acquisition system hardware-in-the-loop, software-in-the-loop, and systems integration laboratories to test systems and train operators in a realistic cyber contested environment.</p> <p>The NCRC will continue to expand the JMN connectivity as needed to provide access to cyber range resources.</p> <p>The NCRC will continue to initiate new cyber range capability and development to directly address United States Army Cyber Command test and training needs.</p> <p>The NCRC will continue activities to establish new government-controlled cyber range facilities, to include facility conversion work, procurement and installation of computing resources, physical security accreditation, and information system security accreditation.</p> <p>The NCRC will continue implementation of an NCRC unclassified (NCRC-U) capability with the establishment of a workforce development training course to start on a continuous basis and assessments of cyber test range innovation challenges.</p> <p>FY 2023 Plans: The NCRC will continue implementing improvements needed to increase capacity to support increased demand at the current and future cyber ranges.</p> <p>The NCRC will continue to build out additional dedicated Persistent Testing and Training Environments to support testing and training customers.</p> <p>The NCRC will continue to operate in support of the growing acquisition program cybersecurity T&E requirements.</p> <p>The NCRC will continue to provide Cyber Table Top support for acquisition programs to help identify and prioritize potential vulnerabilities early in the development lifecycle.</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 6		R-1 Program Element (Number/Name) PE 0605100D8Z / <i>Joint Mission Environment Test Capability (JMETC)</i>		Project (Number/Name) 088 / <i>JMETC National Cyber Range (NCR) Complex</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
The NCRC will continue to provide support to US Cyber Command, Joint Staff, and other training and certification events by developing representative blue, red and gray environments.					
The NCRC will continue to support DOT&E cyber assessments.					
The NCRC will continue to support US Cyber Command and other COCOMS with their training, team certification and mission rehearsal activities.					
The NCRC will conduct engineering activities to plan for technical refresh of emerging end of life and end of service computing assets.					
The NCRC will continue to assess cyber range requirements in close cooperation with the Executive Agents for Cyber Test Ranges and Cyber Training Ranges to build priority cyber range capability and capacity to meet identified RDT&E community and CMF needs.					
The NCRC will continue to assist the Executive Agents for Cyber Test Ranges and Cyber Training Ranges to determine requirements and standards needed to integrate these cyber range facilities with existing acquisition system hardware-in-the-loop, software-in-the-loop, and systems integration laboratories to test systems and train operators in a realistic cyber contested environment.					
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The NCRC will continue implementation of an NCRC unclassified (NCRC-U) capability.					
FY 2022 to FY 2023 Increase/Decrease Statement:					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605100D8Z / Joint Mission Environmen t Test Capability (JMETC)	Project (Number/Name) 088 / JMETC National Cyber Range (NCR) Complex

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
FY 2023 increase to testing cyber vulnerabilities associated with trusted artificial intelligence systems.			
Accomplishments/Planned Programs Subtotals	45.010	57.905	72.676

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense											Date: April 2022																																																																																		
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I</i> BA 6: <i>RDT&E Management Support</i>					R-1 Program Element (Number/Name) PE 0605128D8Z / <i>Classified Program</i>																																																																																								
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost																																																																																	
Total Program Element	977.709	110.000	108.112	0.000	-	0.000	0.000	0.000	0.000	0.000	-	-																																																																																	
128: <i>Classified Program</i>	977.709	110.000	108.112	0.000	-	0.000	0.000	0.000	0.000	0.000	-	-																																																																																	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-																																																																																			
Note New Start (Y/N): No A. Mission Description and Budget Item Justification Classified B. Program Change Summary (\$ in Millions) <table style="width:100%; margin-top: 10px;"> <thead> <tr> <th></th> <th align="right"><u>FY 2021</u></th> <th align="right"><u>FY 2022</u></th> <th align="right"><u>FY 2023 Base</u></th> <th align="right"><u>FY 2023 OCO</u></th> <th align="right"><u>FY 2023 Total</u></th> </tr> </thead> <tbody> <tr> <td>Previous President's Budget</td> <td align="right">110.000</td> <td align="right">0.000</td> <td align="right">0.000</td> <td align="right">-</td> <td align="right">0.000</td> </tr> <tr> <td>Current President's Budget</td> <td align="right">110.000</td> <td align="right">108.112</td> <td align="right">0.000</td> <td align="right">-</td> <td align="right">0.000</td> </tr> <tr> <td>Total Adjustments</td> <td align="right">0.000</td> <td align="right">108.112</td> <td align="right">0.000</td> <td align="right">-</td> <td align="right">0.000</td> </tr> <tr> <td>• Congressional General Reductions</td> <td align="right">-</td> <td align="right">-</td> <td></td> <td></td> <td></td> </tr> <tr> <td>• Congressional Directed Reductions</td> <td align="right">-</td> <td align="right">-</td> <td></td> <td></td> <td></td> </tr> <tr> <td>• Congressional Rescissions</td> <td align="right">-</td> <td align="right">-</td> <td></td> <td></td> <td></td> </tr> <tr> <td>• Congressional Adds</td> <td align="right">-</td> <td align="right">108.112</td> <td></td> <td></td> <td></td> </tr> <tr> <td>• Congressional Directed Transfers</td> <td align="right">-</td> <td align="right">-</td> <td></td> <td></td> <td></td> </tr> <tr> <td>• Reprogrammings</td> <td align="right">-</td> <td align="right">-</td> <td></td> <td></td> <td></td> </tr> <tr> <td>• SBIR/STTR Transfer</td> <td align="right">-</td> <td align="right">-</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> Congressional Add Details (\$ in Millions, and Includes General Reductions) <table style="width:100%; margin-top: 10px;"> <thead> <tr> <th></th> <th align="right"><u>FY 2021</u></th> <th align="right"><u>FY 2022</u></th> </tr> </thead> <tbody> <tr> <td>Project: 128: <i>Classified Program</i></td> <td></td> <td></td> </tr> <tr> <td> Congressional Add: <i>Classified</i></td> <td align="right">110.000</td> <td align="right">108.112</td> </tr> <tr> <td align="right">Congressional Add Subtotals for Project: 128</td> <td align="right">110.000</td> <td align="right">108.112</td> </tr> <tr> <td align="right">Congressional Add Totals for all Projects</td> <td align="right">110.000</td> <td align="right">108.112</td> </tr> </tbody> </table> Change Summary Explanation N/A														<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>	Previous President's Budget	110.000	0.000	0.000	-	0.000	Current President's Budget	110.000	108.112	0.000	-	0.000	Total Adjustments	0.000	108.112	0.000	-	0.000	• Congressional General Reductions	-	-				• Congressional Directed Reductions	-	-				• Congressional Rescissions	-	-				• Congressional Adds	-	108.112				• Congressional Directed Transfers	-	-				• Reprogrammings	-	-				• SBIR/STTR Transfer	-	-					<u>FY 2021</u>	<u>FY 2022</u>	Project: 128: <i>Classified Program</i>			Congressional Add: <i>Classified</i>	110.000	108.112	Congressional Add Subtotals for Project: 128	110.000	108.112	Congressional Add Totals for all Projects	110.000	108.112
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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I</i> BA 6: <i>RDT&E Management Support</i>		R-1 Program Element (Number/Name) PE 0605128D8Z / <i>Classified Program</i>	
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
Congressional Add: Classified		110.000	108.112
FY 2021 Accomplishments: Classified			
FY 2022 Plans: Classified			
Congressional Adds Subtotals		110.000	108.112
D. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
N/A			
E. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> / BA 6: <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605142D8Z / <i>Systems Engineering</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	293.135	44.168	39.904	39.009	0.000	39.009	50.381	48.834	47.134	48.079	Continuing	Continuing
142: <i>Systems Engineering</i>	289.135	37.814	16.931	16.820	0.000	16.820	21.553	21.076	20.654	21.250	Continuing	Continuing
842: <i>Mission Engineering</i>	4.000	4.371	13.055	12.804	0.000	12.804	15.811	15.669	15.520	15.755	Continuing	Continuing
144: <i>Program Engagement and Independent Assessments</i>	0.000	0.000	9.918	9.385	0.000	9.385	13.017	12.089	10.960	11.074	Continuing	Continuing
078: <i>Integration Technology and Tools</i>	0.000	1.983	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.983

Note

New Start (Y/N): No

In FY 2022, funding was realigned from Project Code 078 (Integration Technology and Tools) and Project Code 142 (Systems Engineering) to fund Project Code 842 (Mission Engineering)(ME) and Project Code 144 (Program Engagement and Independent Assessments).

These changes reflect the new organizational structure within the Deputy Directorate, Engineering, including an increased focus on ME activities as key enablers for technology development investment decisions and a refinement of focus that limits Program Technical Assessments (including Independent Technical Risk Assessments (ITRAs)) to Major Defense Acquisition Programs (MDAPs).

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Build a Sustainable and Long-Term Advantage, and Build a Resilient Joint Force and Defense Ecosystem.

This program funds advancement of the engineering practice across the Department of Defense (DoD), conduct of mission engineering/mission integration activities to support the joint warfighting concepts, and program engagements/independent assessments for major defense acquisition programs in accordance with the National Defense Strategy and in support of the critical technology areas advanced by the Under Secretary of Defense for Research and Engineering. Specific activities include:

1. Systems Engineering (P142): Advance engineering practice by developing the DoD-wide policy, guidance, and standards for engineering and test & evaluation; cultivating workforce talent and providing advocacy and oversight for the Department's engineering and test & evaluation workforce; and establishing and maintaining active engineering communities of practice to solve cross-cutting engineering challenges and share best practices.
2. Mission Engineering (P842): Analysis of approaches to realizing mission capabilities vs. anticipated adversary capabilities in relevant operational contexts. This analysis leads to the development of government reference architectures for achieving mission capability, identification of opportunities to align technology investments to accelerate capability delivery or modify existing systems, and recommendations for adjustments to joint warfighting concepts.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 6:</i> <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605142D8Z / <i>Systems Engineering</i>
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3. Program Engagement and Independent Assessments (P144): Conduct of independent technical risk assessments (ITRAs) and other program assessments to advise the DoD leadership (including Milestone Decision Authorities) on progress towards achieving key performance parameters, technology maturation, interoperability, and cyber security posture.

B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	45.626	40.030	0.000	0.000	0.000
Current President's Budget	44.168	39.904	39.009	0.000	39.009
Total Adjustments	-1.458	-0.126	39.009	0.000	39.009
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.449	-			
• Adjustments to Budget Year	-	-	44.119	0.000	44.119
• Other Program Adjustments	-0.009	-	-5.110	-	-5.110
• FFRDC Reduction	-	-0.126	-	-	-

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605142D8Z / <i>Systems Engineering</i>				Project (Number/Name) 142 / <i>Systems Engineering</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
142: <i>Systems Engineering</i>	289.135	37.814	16.931	16.820	0.000	16.820	21.553	21.076	20.654	21.250	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project Code 142 activities include the following functions:

- Support acceleration of USD(R&E)'s modernization initiatives/critical technology areas and Principal Directors' Science and Technology (S&T) roadmap investments.
- Develop and establish the DoD-level policy, guidance, and workforce development efforts ensuring systems engineering rigor in acquisition to drive the development of fully capable and supportable weapons systems.
- Advance the principles of interoperability, integration, modularity, and open systems to improve requirements, architecture, design, development and overall acquisition and sustainment of weapon systems.
- Develop education and training materials for instructing, maintaining, and enhancing the defense acquisition workforce. Activities include: (1) developing guidance to enhance Engineering and Technical Management (ETM) and Test and Evaluation (T&E) acquisition career planning and progression; and (2) monitoring and facilitating Defense Acquisition University (DAU) updates to the systems engineering, quality and specialty engineering courses, to ensure the curriculum represents the education and training requirements necessary to be a viable team member in the acquisition process.
- Improve the DoD's capabilities in specialty engineering and software engineering through policy, program oversight, fostering practice and technology improvements, initiating long-term strategic improvements, and collaborating with industry and academia.
- Develop improved and enhanced software Science and Technology strategies consistent with National Defense Authorization Act for 2020, Section 255 to accelerate modernization of software development tools, techniques and capabilities.
- Advance the DoD engineering practices through the development and use of methods, processes, and tools, such as digital engineering, modeling and simulation, and model-based systems engineering, for engineering on weapon systems.
- Serve as the Defense Standardization Executive and oversee the Defense Standardization Program.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Systems Engineering (Project Code 142)	30.010	15.985	16.820	0.000	16.820
FY 2022 Plans:					
FY 2022 Plans:					
Strategic Thrust 1: Workforce Development					
<ul style="list-style-type: none"> • Streamline the current Engineering (ENG), Production, Quality, and Manufacturing (PQM), and Science & Technology (S&TM) career fields into a single (ETM) Career Field and serve as the Functional Lead for ETM and the (T&E) Career Fields. • Pursue workforce development initiatives including leadership development, specialized training, and improved instructional methods. 					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022		
Appropriation/Budget Activity 0400 / 6		R-1 Program Element (Number/Name) PE 0605142D8Z / Systems Engineering		Project (Number/Name) 142 / Systems Engineering		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<ul style="list-style-type: none">Assess ETM and T&E workforce capability and capacity, and, working with Services and other components organizations, develop strategies to address identified gaps. <p>Strategic Thrust 2: Engineering Policy and Guidance</p> <ul style="list-style-type: none">Develop and update core Engineering and T&E policy, guidance and standards; review all acquisition policy for Engineering and T&E implications, including requirements for use in alternate acquisition pathways.Develop policy and guidance on System of Systems (SoS) architecture analysis, system architecture verification, interoperability analysis, architecture development plans, and SoS-level capability gaps.Assess challenges and impacts and develop new guidance, best practices, methods, processes and tools to more effectively implement Engineering for product lines and SoS. <p>Strategic Thrust 3: Specialty Engineering</p> <ul style="list-style-type: none">Develop engineering guidance and policies for the integration of specialty engineering functions as part of the SE responsibility in the acquisition process including, but not limited to: manufacturing engineering; reliability and maintainability engineering; human systems integration; and value engineering.Conduct activities to develop and implement plans to enhance the specialty engineering workforce. <p>Strategic Thrust 4: Software Engineering and Modernization</p> <ul style="list-style-type: none">Develop software engineering guidance and policies for the integration of modern software practices as part of the SE responsibility in the acquisition process including, but not limited to: agile software development; DevSecOps; model based systems and software engineering; and the implementation of industry best practices.Conduct studies and analyses to identify challenges and opportunities for the development and promulgation of software engineering best practices and guidance for defense acquisition programs. <p>Strategic Thrust 5: Systems Engineering Modernization Strategy</p> <ul style="list-style-type: none">Develop Framework, Pain Points and Roadmaps to support Systems Engineering Modernization efforts.Recommend new Systems Engineering Policies & Processes.Update Systems Engineering Workforce Development Strategy. <p>Strategic Thrust 6: Engineering Tools and Environments</p> <ul style="list-style-type: none">Develop and sustain the Digital Engineering Community of Practice (CoP) that concentrates on sharing best practices, developing solutions to common concerns, and establishing a body of knowledge repository that is flexible to serve varying users' viewpoints across the DoD.						

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022		
Appropriation/Budget Activity 0400 / 6		R-1 Program Element (Number/Name) PE 0605142D8Z / Systems Engineering		Project (Number/Name) 142 / Systems Engineering		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<ul style="list-style-type: none">• Apply digital engineering practices and body-of-knowledge information, to include using model-based processes, products, training, data/model management, to support analysis of prototype development efforts, ease integration of emerging technologies, and gauge impacts on overall mission performance.• Provide digital engineering implementation inputs to policy, guidance, and engineering workforce competency efforts. <p>Strategic Thrust 7: Connect the Engineering Community</p> <ul style="list-style-type: none">• Identify the current needs and specific implementations of engineering users of digital tools and environments, leading to unified effort to establish a connected engineering community, sharing tools, methods and data in order to provide engineering quality data to support decision makers.• Experiment with new computational capabilities (e.g. cloud) to discover the benefits and challenges for the engineering community.• Identify Knowledge Management techniques to provide systematic approaches for information and knowledge flow to and between the stakeholders at the right time for the right use. <p>Strategic Thrust 8: Modeling and Simulation (M&S)</p> <ul style="list-style-type: none">• Transform the Defense Modeling and Simulation Coordination Office into the Model and Simulation Enterprise with a focus on re-establishing and leading the Defense Model and Simulation Enterprise CoP to increase effective and efficient development and use of methods, processes, and tools for the model and simulation community.• Plan the transformation of the model and simulation suite of knowledge management tools to enable discoverability and reuse of joint and cross-cutting capabilities.• Evaluate model/simulation issuances for currency and suitability, and evolve the relevant model and simulation policies and guidance, using the CoP challenges as a guide in prioritization. <p>FY 2023 Base Plans: Continued execution of the Strategic Thrusts identified within the FY 2022 Plans above, with planned expansion of scope of these activities.</p> <p>FY 2023 OCO Plans: N/A.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.</p>						
Title: Positioning, Navigation, and Timing (PNT) Open Architecture		7.804	0.946	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022		
Appropriation/Budget Activity 0400 / 6		R-1 Program Element (Number/Name) PE 0605142D8Z / <i>Systems Engineering</i>		Project (Number/Name) 142 / <i>Systems Engineering</i>		
B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>Description: Build and validate the common DoD open reference architecture standard for PNT systems:</p> <ul style="list-style-type: none"> • Common messaging/interface standards increases PNT system and element interoperability across the services and reduces future PNT system development/integration costs. • Common reference architecture guides development of service and platform specific PNT solutions. • Streamlines integration of new complementary sensor technology into existing and future DoD systems. <p>FY 2022 Plans: Continue development of a modular open system architecture for positioning, navigation, and timing systems. Continue development of PNT interface standards based on previous work from the DARPA All-Source Positioning and Navigation program.</p> <p>FY 2023 Base Plans: Completion and close-out of the remaining efforts under this task.</p> <p>FY 2023 OCO Plans: N/A.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The decrease is attributable to the full completion of the efforts in the Positioning, Navigation and Timing Open Architecture task.</p>						
Accomplishments/Planned Programs Subtotals		37.814	16.931	16.820	0.000	16.820
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks						
D. Acquisition Strategy N/A						

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605142D8Z / <i>Systems Engineering</i>				Project (Number/Name) 842 / <i>Mission Engineering</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
842: <i>Mission Engineering</i>	4.000	4.371	13.055	12.804	0.000	12.804	15.811	15.669	15.520	15.755	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project Code 842 activities include the following functions:

- Carry out responsibilities described in the National Defense Authorization Act for FY 2017, Section 855 titled Mission Integration Management (MIM) and supports the National Defense Strategy goals of developing new joint warfighting concepts and modernization of emerging capabilities to achieve a more lethal force.
- Achieve full operational capability of the mission engineering framework that is being built in FY 2021 to instantiate the technical element of MIM and identify and promulgate best practices for mission-focused analyses and studies.
- Ensure the DoD applies engineering rigor to both operational and technical analysis of future capabilities to enable the DoD leaders to make informed investment decisions and deliver technologies and capabilities to close mission gaps in response to new threats.
- Execute multiple mission engineering studies in support of the National Defense Strategy modernization areas to identify technology solutions, advise on development of requirements, and develop Government Reference Architectures (GRA) for new joint warfighting capabilities, which are a key enterprise document that will be used to guide development of capabilities that are required for warfighters to carry out operational and tactical missions against our adversaries.
- In coordination with the Joint Staff, OSD(CAPE), USD(A&S), Combatant Commands, Services, and other stakeholders, provide engineering analysis and studies at the campaign, mission, and engagement levels to support the prioritization and development of the Department's technology modernization and prototyping roadmaps.
- Continue the development of the technical infrastructure and analysis tools for engineering studies and data mining as well as modeling and simulation analytic tools to support this effort.
- Support the analysis of as is operational and technical architectures of current joint capabilities and further support the development of to be GRAs of future required capabilities to align investment opportunities with emerging technological developments.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Mission Integration	4.371	13.055	12.804	0.000	12.804
FY 2022 Plans:					
Strategic Thrust 1: Develop GRAs					
<ul style="list-style-type: none"> • Develop methods for governing changes and managing technical data for GRAs. • Develop and conduct training in use of reference architectures. • Establish enduring mission engineering analytic capability; instantiate a digital ecosystem to share knowledge amongst Mission Integration Management stakeholders. • Participate in mission engineering activities by providing functional and program specific engineering expertise to support joint mission level analysis. 					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605142D8Z / <i>Systems Engineering</i>	Project (Number/Name) 842 / <i>Mission Engineering</i>	

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<ul style="list-style-type: none"> • Perform high-level executable system of system architecture trades and analyses for product line and technology to address mission capability gap derived from new joint warfighting concepts, strategic portfolio reviews, and national defense guidance. • Develop and update government reference architectures for selected programs within the USD(R&E) critical technology areas, in particular Future Networked C3 (FNC3), directed energy, hypersonics, and cyber. • Maintain the architecture guidance and the publication of a Mission Engineering Guide and support associated training material across DoD and industry partners. <p>Strategic Thrust 2: Integrate Models with Advanced Analytic and Computational Tools</p> <ul style="list-style-type: none"> • Enable rapid design and analysis of current and future weapon systems. • Fully implement the Mission Engineering analytical framework as the technical component of MIM and expand its use across government and industry. • Perform architecture tradeoff analyses to enable effective mission engineering and manage integration of emerging technologies with systems in development and / or in operation. Leverage this information to assist the Department of Defense Under Secretary for Acquisition and Sustainment (USD(A&S)) with its Capability Portfolio Management process to ensure current systems maintain relevancy in the future warfare environment. • Perform architecture assessments to verify compliance of major systems interfaces through use of standards. Provide recommendations to improve joint and allied interoperability. • Execute system architecture verification, interoperability analysis, architecture development plans, and SoS-level capability gaps analysis. <p>Strategic Thrust 3: Support Joint Mission Level Analysis</p> <ul style="list-style-type: none"> • Provide functional and program specific mission engineering expertise in the areas of contested logistics, hypersonics, electromagnetic spectrum, joint C2, NC3, directed energy, autonomy, missile defense, and others as directed. • Expand mission engineering support for up to six high priority mission sets as determined by USD(R&E) and support decisions for identification of joint mission-based prototyping projects. • Further mature and maintain processes and tools required to establish data relationships to enable discovery, standardization, and usability of the mission engineering data across the DoD. <p>Strategic Thrust 4: Create Opportunities to Maintain a Tactical Edge</p> <ul style="list-style-type: none"> • Enable innovative and timely application of new warfighting concepts, insertion of advanced capabilities on shorter timelines, improving interoperability, and formulating long-term strategies to retain or improve our technical overmatch against our adversaries. 					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022		
Appropriation/Budget Activity 0400 / 6		R-1 Program Element (Number/Name) PE 0605142D8Z / <i>Systems Engineering</i>		Project (Number/Name) 842 / <i>Mission Engineering</i>		
<u>B. Accomplishments/Planned Programs (\$ in Millions)</u>						
		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<ul style="list-style-type: none"> • Continue the support for NC3 governance activities; conduct NC3 mission engineering studies to support development of GRAs and provide recommendations for research and development efforts; and support the development of the NC3 Modernization Alignment White Paper and Annual R&D Plan. • Expand USD(R&E) participation in the Joint Capabilities Integration and Development System (JCIDS) and Joint Force Integration Cell (JFIC) efforts to support development and maturation of new joint warfighting concepts; enhance capability and development of systems requirements through mission engineering insights. • Support: (1) Services and COCOMs in pre-MS A formulation; (2) requirements analyses and analysis of alternatives; (3) architectures to guide development of prototyping and experimentation roadmaps; and (4) inform initial capabilities document definition and development. <p><i>FY 2023 Base Plans:</i> Continued execution of the Strategic Thrusts identified within the FY 2022 Plans above with planned expansion of scope of Mission Integration Management activities that both implement the National Defense Authorization Act for FY 2017 Section 855 and support the National Defense goals of developing new joint warfighting concepts and modernizing capabilities to achieve a more lethal force.</p> <p><i>FY 2023 OCO Plans:</i> N/A.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> There is no significant change between FY 2022 and FY 2023.</p>						
Accomplishments/Planned Programs Subtotals		4.371	13.055	12.804	0.000	12.804
<u>C. Other Program Funding Summary (\$ in Millions)</u> N/A						
<u>Remarks</u>						
<u>D. Acquisition Strategy</u> N/A						

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605142D8Z / <i>Systems Engineering</i>				Project (Number/Name) 144 / <i>Program Engagement and Independent Assessments</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
144: <i>Program Engagement and Independent Assessments</i>	0.000	0.000	9.918	9.385	0.000	9.385	13.017	12.089	10.960	11.074	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project Code 144 activities include the following functions:

- Conducts and approves Independent Technical Risk Assessments (ITRAs) on Acquisition Category (ACAT)-1D Major Defense Acquisition Programs (MDAPs). Reviews and approves ITRAs on select high priority ACAT 1B/1C MDAPs.
- Conceive plans and conducts Preliminary and Critical Design Review Assessments of MDAPs under the Office of the Secretary of Defense (OSD) purview.
- Pursuant to U.S.C. 10 Sec 2366 requirements, provides basis for critical technology and manufacturing process determinations and certifications of MDAPs under OSD purview.
- Satisfies U.S.C. 10 Sec 2448a requirements by providing risk assessments to support the development of cost, schedule, and performance targets.
- Support acceleration of USD(R&E)'s critical technology initiatives in accordance with the National Defense Strategy.
- Conduct other technical reviews as requested, such as Nunn-McCurdy certification reviews, Non-Advocate Reviews, focused technical assessments, and software readiness reviews to identify and mitigate program risk.
- Oversee Service and other Component organizations' implementation of engineering initiatives and approve or conduct independent assessments.
- Guide Service and other component organizations in the development planning process to ensure proposed MDAP programs are executable within acceptable levels of risk.
- Provide Systems Engineering support to MDAPs. Review the systems engineering plans (SEPs) and activities for MDAPs.
- Monitor and advise USD(R&E) and USD(A&S) on technical and engineering aspects of MDAPs and select alternate acquisition pathway programs to ensure they are adequate to support fielding and the achievement of cost, schedule and performance goals to include readiness, i.e. producibility, reliability, maintainability, sustainment, and other considerations.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Development Test Evaluation and Assessments	0.000	9.918	9.385	0.000	9.385
FY 2022 Plans:					
Strategic Thrust: Program Support/Technical Risk Assessments					
<ul style="list-style-type: none"> • Enhance and continue to conduct or approve independent technical risk assessments of MDAPs. • Monitor and advise USD(R&E) and USD(A&S) on technical and engineering aspects of MDAPS and select alternate acquisition pathway programs. 					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022		
Appropriation/Budget Activity 0400 / 6		R-1 Program Element (Number/Name) PE 0605142D8Z / <i>Systems Engineering</i>		Project (Number/Name) 144 / <i>Program Engagement and Independent Assessments</i>		
B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<ul style="list-style-type: none"> • Conceive plans and conducts Preliminary and Critical Design Review Assessments of MDAP under OSD purview. • Provide basis for critical technology and manufacturing process determinations and certifications of MDAP under OSD purview in support of U.S.C. 10 Sec 2366 requirements. • Provide risk assessments to support cost, schedule, and performance targets required by U.S.C. 10 Sec 2448a. • Support acceleration of USD(R&E)'s modernization initiatives in accordance with the National Defense Strategy. • Provide engineers and technical leaders to develop and integrate technologies and modernization priorities. • Continued support to acquisition program managers in developing and documenting viable technical management approach. • Conduct technical reviews of acquisition to confirm program execution in accordance with systems engineering plans. • Provides Specialty Engineering support to ITRAs and other assessments. • Perform early acquisition risk assessment including pre-Milestone A engagement with Joint Requirements Oversight Council processes. <p><i>FY 2023 Base Plans:</i> Continued execution of the Strategic Thrusts identified within the FY 2022 Plans.</p> <p><i>FY 2023 OCO Plans:</i> N/A.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> There is no significant change between FY 2022 and FY 2023.</p>						
Accomplishments/Planned Programs Subtotals		0.000	9.918	9.385	0.000	9.385
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks						
D. Acquisition Strategy N/A						

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605142D8Z / <i>Systems Engineering</i>				Project (Number/Name) <i>078 / Integration Technology and Tools</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
<i>078: Integration Technology and Tools</i>	0.000	1.983	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.983
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2022, \$2.008 million of funding from this Project Code is re-aligned to Project Code 142 (\$1.119 million), Project Code 144 (\$0.252), and Project Code 842 (\$0.637) to better align with organizational and functional structure.

A. Mission Description and Budget Item Justification

Project Code 078 supported the National Defense Strategy goals of developing a more lethal force by instituting enterprise-wide research, methods, practices and tools to: improve systems engineering practices; support modular, rapid fielding of mature warfighting capabilities; and use common, reusable hardware and software components that can be more readily adapted and refreshed, allowing the DoD to deploy and support the latest technologies. The project also sustained the ability to identify and/or create innovative methods and tools in systems engineering practice to improve the Department's ability to develop and deploy complex weapon systems.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<i>Title:</i> Integration Technology and Tools	1.983	0.000	0.000	0.000	0.000
<i>Description:</i> Supported the National Defense Strategy goals of developing a more lethal force by instituting enterprise-wide research, methods, practices and tools to: improve systems engineering practices; support modular, rapid fielding of mature warfighting capabilities; and use common, reusable hardware and software components that can be more readily adapted and refreshed, allowing the DoD to deploy and support the latest technologies. The project also sustained the ability to identify and/or create innovative methods and tools in systems engineering practice to improve the Department's ability to develop and deploy complex weapon systems.					
<i>FY 2022 Plans:</i> Funding in FY 2022 and out-year re-aligned to other Project Codes within the Systems Engineering Program Element (PE).					
<i>FY 2023 Base Plans:</i> N/A					
<i>FY 2023 OCO Plans:</i>					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022	
Appropriation/Budget Activity 0400 / 6		R-1 Program Element (Number/Name) PE 0605142D8Z / <i>Systems Engineering</i>		Project (Number/Name) 078 / <i>Integration Technology and Tools</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO
N/A					
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> N/A					
Accomplishments/Planned Programs Subtotals		1.983	0.000	0.000	0.000
C. Other Program Funding Summary (\$ in Millions) N/A					
Remarks					
D. Acquisition Strategy N/A					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support					PE 0605151D8Z / Studies and Analysis Support – OSD							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	32.786	6.720	4.612	5.716	-	5.716	6.257	6.295	6.429	6.556	-	-
151: Studies and Analysis Support – OSD	32.786	6.720	4.612	5.716	-	5.716	6.257	6.295	6.429	6.556	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives Taking Care of People and Build Sustainable and Long-Term Advantage.

The OUSD(P&R)'s Studies and Analysis Support program serves to leverage specialized expertise and critical capabilities designed to help meet varied research, study, and analytical support needs in the manpower, personnel, human capital, force readiness, training, education, resiliency, and health services portfolio. This funding supports intellectually rigorous, relevant and timely assessment of policies, programs, and procedures across the personnel and readiness enterprise. Funded research, studies, program evaluations, surveys, and analysis support P&R roles in executing the National Defense Strategy in a proactive and forward leaning posture, focusing on a strategic programmatic and policy framework for the future.

Funding is leveraged to address key, strategic, and long-term challenges facing the Department, and include targeted assessments to support program evaluation and efficacy. It also encompasses comprehensive research and complex exploration to support data driven decision-making and critical analysis to develop needed evidentiary bases for policy development or modification.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	5.777	4.612	0.000	-	0.000
Current President's Budget	6.720	4.612	5.716	-	5.716
Total Adjustments	0.943	0.000	5.716	-	5.716
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-0.001	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	1.049	-			
• SBIR/STTR Transfer	-0.105	-			
• Adjustments to Budget Year	-	-	5.716	-	5.716

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support	R-1 Program Element (Number/Name) PE 0605151D8Z / Studies and Analysis Support – OSD	
<div>Change Summary Explanation</div> <div>FY 2023 funding increase reflects the fact that the FY 2022 President's Budget did not include out-year funding.</div>		

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605151D8Z / Studies and Analysis Support – OSD				Project (Number/Name) 151 / Studies and Analysis Support – OSD			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
151: Studies and Analysis Support – OSD	32.786	6.720	4.612	5.716	-	5.716	6.257	6.295	6.429	6.556	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The OUSD(P&R) Studies and Analysis Support program serves to leverage specialized expertise and critical capabilities designed to help meet varied research, study, and analytical support needs in the manpower, personnel, human capital, force readiness, training, education, resiliency, and health services portfolio. This funding line supports independent, intellectually rigorous, relevant, impartial, objective, and timely assessment of policies, programs, and procedures across the personnel and readiness enterprise. Funded research, studies, program evaluations, surveys, and analysis support P&R in executing the National Defense Strategy and DoD leadership priorities in a proactive and forward leaning posture, focusing on a strategic programmatic and policy framework for the future of the Department's force development, resiliency, and readiness. Funding is leveraged to address key, strategic, and long-term challenges facing the Department, and include targeted assessments to support program evaluation and efficacy. It also encompasses comprehensive research and complex exploration to support data driven decision-making and critical analysis to develop needed evidentiary bases for policy development or modification in support of Administration priorities, Congressional direction, and Secretary of Defense direction.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Studies and Analysis Support – OSD	6.720	4.612	5.716
Description: P&R's Studies and Analysis program is focused on efforts that align with the National Defense Strategy and our vision of a strategically ready, globally relevant, and flexibly sustainable Total Force enabled by digital modernization for data dominance. Resources fund Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Centers (UARCs), and other contracts for studies, analysis, research, and surveys that address the strategic challenges facing P&R and the Department of Defense, reflect enterprise-wide equities, focus on strategic programmatic and policy frameworks, and demonstrate how we cannot accomplish internally or through other means.			
FY 2022 Plans: Specific endeavors are anticipated to focus on: <ul style="list-style-type: none"> • Promote military readiness by decreasing the prevalence of readiness-detracting behavior through integrated prevention efforts; increased reporting to connect those impacted with quality care; and holding offenders appropriately accountable. • Promote a culture that represents our core military values and advances military readiness, through comprehensive actions that support: 1) diversity, equity, inclusion, and accessibility; and 2) an environment free from extremist behavior. • Vigorously address and mitigate stigma associated with mental health care, improve suicide prevention, and enhance the provision of care for all Service members through new and existing collaborative efforts that inform policy and programs. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605151D8Z / <i>Studies and Analysis Support – OSD</i>	Project (Number/Name) 151 / <i>Studies and Analysis Support – OSD</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> Establish strategic readiness as a foundational concept driving Departmental decision-making, informing all relevant Departmental policies, processes, and strategic guidance with data-driven analysis and modeling to provide an objective assessment of risks and tradeoffs. Encouraging innovative solutions to an ever-increasing range of challenges including climate change. <p>FY 2023 Plans: Specific endeavors are anticipated to focus on:</p> <ul style="list-style-type: none"> Promote military readiness by decreasing the prevalence of readiness-detracting behavior through integrated prevention efforts; increased reporting to connect those impacted with quality care; and holding offenders appropriately accountable. Promote a culture that represents our core military values and advances military readiness, through comprehensive actions that support: 1) diversity, equity, inclusion, and accessibility; and 2) an environment free from extremist behavior. Vigorously address and mitigate stigma associated with mental health care, improve suicide prevention, and enhance the provision of care for all Service members through new and existing collaborative efforts that inform policy and programs. Establish strategic readiness as a foundational concept driving Departmental decision-making, informing all relevant Departmental policies, processes, and strategic guidance with data-driven analysis and modeling to provide an objective assessment of risks and tradeoffs. Encouraging innovative solutions to an ever-increasing range of challenges including climate change. <p>FY 2022 to FY 2023 Increase/Decrease Statement: The FY2023 funding was increased by \$1,104,000 to accomplish SECDEF related priorities to study diversity, equity and inclusion, and changes in climate on readiness. OUSD(P&R) has taken significant steps to improve governance of our studies program, increasing senior leader accountability and ensure more robust return on investment.</p>			
Accomplishments/Planned Programs Subtotals		6.720	4.612
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605161D8Z / <i>Nuclear Matters - Physical Security</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	45.098	16.013	14.348	15.379	-	15.379	15.813	15.559	15.088	15.087	-	-
161: <i>Nuclear Matters</i>	45.098	16.013	14.348	15.379	-	15.379	15.813	15.559	15.088	15.087	-	-

Note

New Start (Y/N): No

Program addresses modernization and sustainment of the nuclear stockpile using modeling and analysis to make data-driven decisions.

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Defend the Homeland, Provide Nuclear Deterrence, and Build Sustainable and Long-Term Advantage.

The mission of Nuclear Matters is to ensure the continued credibility, effectiveness, safety, and security of the U.S. deterrent in order to deter nuclear and non-nuclear attack, assure U.S. allies and partners, achieve U.S. objectives if deterrence fails, and hedge against an uncertain future. Nuclear Matters serves as the Department of Defense (DoD) focal point for the modernization and sustainment of the U.S. nuclear weapons stockpile, as well as for a wide range of nuclear counter-terrorism and counter-proliferation issues.

The funds for this program are used to support research, development, test and evaluation efforts as well as studies and analyses for nuclear weapons modernization, sustainment, security, use control, nuclear weapons stockpile safety, and survivability requirements. Funds are also used to develop and implement plans for stockpile transformation; infrastructure analyses and assessments; DoD-National Nuclear Security Administration (NNSA) Nuclear Weapons Council (NWC) activities, as mandated by Title 10 USC, section 179; radiological and nuclear emergency response efforts; and management of international programs of nuclear cooperation, particularly with respect to enhancing international nuclear safety and security. Nuclear Matters is also responsible for policy development and implementation for personnel reliability; nuclear weapons, nuclear command and control, and special nuclear materials security; use control; nuclear weapons transportation; physical security equipment; countering nuclear threats; and nuclear and radiological incident response. Additionally, Nuclear Matters serves as the focal point for DoD activities and initiatives related to the dual missions of sustaining a safe, secure, and effective nuclear deterrent and countering the threat from nuclear terrorism and nuclear proliferation.

Nuclear Matters is leading a series of efforts to provide data-driven support to integrated portfolio management for 21st century nuclear deterrent sustainment and modernization. The United States is modernizing all three legs of its nuclear triad and is also reconstituting its nuclear weapons production capability at roughly the same time, while simultaneously sustaining weapons and systems that have aged well beyond their original design lives. The NWC and similar bodies seek to manage the transition from legacy Cold War delivery systems and weapons, to replacement systems and warheads, and make decisions that will affect U.S. national security through the end of the 21st century. To field a modern, threat-informed, nuclear deterrent that will keep pace with evolving adversary capabilities, it is necessary to conduct a variety of assessment and study efforts to support data-driven decisions concerning the future of the U.S. nuclear deterrent.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I</i> BA 6: <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605161D8Z / <i>Nuclear Matters - Physical Security</i>
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This Program Element can fund travel to support the requirements of this program.

This appropriation will finance work, including manpower, performed by a government agency or by private individuals or organizations under a contractual or grant arrangement with the government who conduct research (systematic study directed toward fuller scientific knowledge or understanding of the subject studied), development (systematic use of the knowledge and understanding gained from research, for the production of useful materials, devices, systems, or methods, including the design and development of prototypes and processes) and test and evaluation efforts.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	16.542	14.429	0.000	-	0.000
Current President's Budget	16.013	14.348	15.379	-	15.379
Total Adjustments	-0.529	-0.081	15.379	-	15.379
• Congressional General Reductions	-	-0.081			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.529	-			
• Adjustments to Budget Year	-	-	15.379	-	15.379

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605161D8Z / Nuclear Matters - Physical Security				Project (Number/Name) 161 / Nuclear Matters			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
161: Nuclear Matters	45.098	16.013	14.348	15.379	-	15.379	15.813	15.559	15.088	15.087	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The mission of the Nuclear Matters program is to sustain the U.S. nuclear deterrent posture, counter nuclear threats, and to develop nuclear and conventional physical security equipment. The funds for this program are used to support developmental, test and evaluation efforts, as well as, studies and analyses for nuclear weapons security, use control, nuclear weapons stockpile safety, survivability and performance, nuclear forensics, and office management.

Funds are also used to develop and implement plans for stockpile transformation; infrastructure analyses, assessments, and models; NWC activities, as mandated by Title 10 USC, section 179; radiological and nuclear emergency response efforts; and management of international programs of nuclear cooperation, particularly with respect to enhancing international nuclear safety and security.

Nuclear Matters is also responsible for policy development and implementation for personnel reliability; nuclear weapons, nuclear command and control, and special nuclear materials security; use control; nuclear weapons transportation; physical security equipment; countering nuclear threats; and nuclear and radiological incident response.

This appropriation will finance work, including manpower, performed by a government agency or by private individuals or organizations under a contractual or grant arrangement with the government who conduct research (systematic study directed toward fuller scientific knowledge or understanding of the subject studied), development (systematic use of the knowledge and understanding gained from research, for the production of useful materials, devices, systems, or methods, including the design and development of prototypes and processes) and test and evaluation efforts.

This Program Element can fund travel to support the requirements of this program.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Nuclear Weapons Council (NWC)	0.475	0.768	0.825
Description: The NWC is a joint DoD and Department of Energy (DOE)/National Nuclear Security Administration (NNSA) organization established by Congress to facilitate cooperation and coordination between the two Departments as they fulfill their dual agency responsibilities for U.S. nuclear weapons stockpile management.			
FY 2022 Plans:			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>- Oversaw the activities of the Congressionally-mandated Joint DoD-DOE NWC and its support committees to include the Nuclear Weapons Council Standing and Safety Committee, the Compartmented Advisory Committee, and the Action Officer group.</p> <p>FY 2023 Plans:</p> <p>- Continue to oversee the activities on the Congressionally-mandated Joint DoD-DOE NWC and its support committees to include the Nuclear Weapons Council Standing and Safety Committee, the Compartmented Advisory Committee, and the Action Officer group.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p> <p>There is no significant change between FY 2022 and FY 2023.</p>				
<p>Title: International Nuclear Programs and Nuclear Forensics, Resiliency, and Survivability</p> <p>Description: The United States participates in several international programs of cooperation regarding nuclear weapons with foreign governments and regional defense organizations that involve unclassified and classified information exchanges. In general, these agreements are designed to promote safety and security, advance stockpile stewardship, and collaborate in counter-proliferation efforts.</p> <p>Per Presidential Policy Directive 42, Annex C, the DoD provides the USG post-detonation NTNF capability. Per DoD Directive 2060.04, the Office of the Undersecretary of Defense for Acquisition & Sustainment (OUSD(A&S)) is the office responsible for developing and leading DoD's NTNF capabilities. Ensuring the USG can identify the source of nuclear material and hold those responsible for an attack accountable is critical to our national defense and security. Internal and independent assessments indicate new capabilities are needed to sustain an effective deterrent against nuclear attack and meet the challenges of future threats.</p> <p>FY 2022 Plans:</p> <p>- Built programs of cooperation with international partners through tri and bi-lateral annual, bi-annual, semi-annual, and monthly engagements under Mutual Defense Agreements.</p> <p>- Sponsored international partners at national-level nuclear weapons accident/incident exercises, workshops, render safe exercises through tri-lateral engagements under Mutual Defense Agreements.</p> <p>FY 2023 Plans:</p> <p>- Continue confidence building programs of cooperation with international partners through tri and bi-lateral annual, bi-annual, semi-annual, and monthly engagements under Mutual Defense Agreements.</p> <p>- Continue to sponsor international partners at national-level nuclear weapons accident/incident exercises, workshops, render safe exercises through tri-lateral engagements under Mutual Defense Agreements.</p>		0.200	0.250	0.718

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Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605161D8Z / Nuclear Matters - Physical Security	Project (Number/Name) 161 / Nuclear Matters		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
- Invest in nuclear forensics, survivability, and resiliency requirements to address DoD and nuclear enterprise needs				
FY 2022 to FY 2023 Increase/Decrease Statement: The FY 2022 to FY 2023 increase is the result of additional focus on resiliency and survivability requirements.				
Title: Nuclear Surety		0.745	0.852	0.962
Description: Because of their political and military importance, destructive power, and the potential consequences of an accident or unauthorized act, nuclear weapons and nuclear weapon systems require special consideration--nuclear surety-- and must be protected against risks and threats inherent in their peacetime and wartime environments. Oversight of the DoD nuclear surety program is provided by the Deputy Assistant Secretary of Defense for Nuclear Matters.				
FY 2022 Plans: - Conducted OSD oversight and provided direction for actions taken under DoDI 4540.05,Transportation of U.S. Nuclear Weapons; DoDD S-5210.81, United States Nuclear Weapons Command and Control, Safety, and Security; DoDI S-3150.07, Controlling the Use of Nuclear Weapons and DoDI S-5210.82, Protection Nuclear Weapons Coding Equipment; DoDI 5210.42, Nuclear Weapons Personnel Reliability Assurance and DoDM 5210.42, Nuclear Weapons Personnel Reliability Program; and DoDD 5210.41, Security Policy for Protecting Nuclear Weapons, DoDI O-5210.63, DoD Procedures for Security of Nuclear Reactors and Special Nuclear Materials, and DoD S-5210.92M, Physical Security for Nuclear Command and Control (NC2) Facilities.				
FY 2023 Plans: - Continue to conduct OSD oversight and provide direction for actions taken under DoDI 4540.05,Transportation of U.S. Nuclear Weapons; DoDD S-5210.81, United States Nuclear Weapons Command and Control, Safety, and Security; DoDI S-3150.07, Controlling the Use of Nuclear Weapons and DoDI S-5210.82, Protection Nuclear Weapons Coding Equipment; DoDI 5210.42, Nuclear Weapons Personnel Reliability Assurance and DoDM 5210.42, Nuclear Weapons Personnel Reliability Program; and DoDD 5210.41, Security Policy for Protecting Nuclear Weapons, DoDI O-5210.63, DoD Procedures for Security of Nuclear Reactors and Special Nuclear Materials, and DoD S-5210.92M, Physical Security for Nuclear Command and Control (NC2) Facilities.				
FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.				
Title: Stockpile Transformation		2.523	3.000	3.000
Description: To meets its security needs and those of its allies, the U.S. will need a safe, secure, and reliable nuclear deterrent for the foreseeable future. There's increased risk, absent nuclear testing, in assuring long-term safety and reliability of today's aging stockpile—the legacy warheads left over from the Cold War. Today's nuclear weapons enterprise is not sufficiently				

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
responsive to technical problems in the stockpile, or to potential emerging threats. The task is to ensure the U.S. nuclear weapons stockpile and supporting infrastructure, meets long-term national security needs.			
FY 2022 Plans: <ul style="list-style-type: none"> - Conducted life cycle activities in support of the nuclear weapons stockpile under DoDD 3150.01, Joint DoD-DOE/NNSA Nuclear Weapon Life-Cycle Activities and DoDM 5030.55, DoD Procedures for Joint DoD-DOE Nuclear Weapons Life Cycle Activities. - Managed DoD RDT&E activities for nuclear warheads to include B61, W76, W78, W80, B83, W87, W88 Weapons. - Supported studies for warhead replacement. FY 2023 Plans: <ul style="list-style-type: none"> - Continue to conduct life cycle activities in support of the nuclear weapons stockpile under DoDD 3150.01, Joint DoD-DOE/NNSA Nuclear Weapon Life-Cycle Activities and DoDM 5030.55, DoD Procedures for Joint DoD-DOE Nuclear Weapons Life Cycle Activities. - Continue to manage DoD RDT&E activities for nuclear warheads to include B61, W76, W78, W80, B83, W87, W88 Weapons. - Continue to support studies for warhead replacement. FY 2022 to FY 2023 Increase/Decrease Statement: There is no significant change between FY 2022 and FY 2023.			
Title: Nuclear Matters Support Description: Support to Nuclear Matters includes the following: <ul style="list-style-type: none"> - Managing the operational, technical, and administrative support for the NWC and its subordinate bodies for a Safe, Secure, Effective, and Credible Nuclear Deterrent. - Developing and coordinating all reports to the President and Congress as mandated by public law including the Report on Stockpile Assessments, Nuclear Weapons Stockpile Memorandum, NWC Certification of the NNSA Budget, Nuclear Weapons Stockpile Report, Joint Surety Report. Stockpile Stewardship and Management Plan, and Report on Platform Assessment. - Developing technical content for briefings, reports, and decision letters; guides documents through coordination; and resolves issues within and between the agencies. - Maintaining official records of NWC and subordinate body proceedings and other official documents. - Address Original Classification Authority requirements for Formally Restricted Data. - Reviewing and documenting Freedom of Information Act and Mandatory Declassification Requests (Annual average of over 500 nuclear-related requests). FY 2022 Plans:		0.676	0.865
			0.945

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605161D8Z / <i>Nuclear Matters - Physical Security</i>	Project (Number/Name) 161 / <i>Nuclear Matters</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> - Submitted annual reports to the President and the Congress. - Oversaw DoD/DOE relationship regarding the survivability and surety of the national nuclear stockpile. - DoD Sigma 15 Approval Authority (Interface with DOE/NNSA). - Addressed Original Classification Authority requirements for Formally Restricted Data. - Addressed Freedom of Information Act and Mandatory Declassification Requests. <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue to submit annual reports to the President and the Congress. - Continue to oversee DoD/DOE relationship regarding the survivability and surety of the national nuclear stockpile. - Continue as DoD Sigma 15 Approval Authority (Interface with DOE/NNSA). - Continue to address Original Classification Authority requirements for Formally Restricted Data. - Continue to address Freedom of Information Act and Mandatory Declassification Requests. <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2022 to FY 2023 increase supports requirements for expected contract escalation costs, otherwise, there is no significant programmatic increase.</p>			
<p>Title: Physical Security and PPBE Support</p> <p>Description: This support addresses program management, evaluation, and resourcing functions associated with the Physical Security Enterprise & Analysis Group (PSEAG), the Security Policy Verification Committee, and National Technical Nuclear Forensics programs. This support also includes Planning, Programming, Budgeting and Execution (PPBE) for the Office of the Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs and the Office of the Deputy Assistant Secretary of Defense for Nuclear Matters.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> - Assisted with coordinating, planning and executing nuclear and conventional physical security development, test, evaluation and deployment of projects executed by the Military Departments by ensuring joint capability gaps are identified and to avoid duplication of effort across the DoD to maximize use of limited funds. - Assisted Nuclear Matters and the PSEAG pursue a joint-layered defense approach to Counter-Unmanned Systems (C-UxS) by integrating sensors and systems into physical security architectures and command and control systems to address this threat. - Coordinated efforts across the DoD, interagency and international partners to develop C-UxS solutions that address the entire kill chain (Detect, Track, Identify, and Defeat) that support valid requirements while eliminating duplication of effort, pursuing the use of government and commercial off-the-shelf (GOTS/COTS) products, ensuring systems integration, and promoting interoperability and sustainability. 		2.983	3.013
		3.233	

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>- Supported all phases of the PPBE process and meet all mandated timelines for submission of related documents; contribute to the development of PPBE policy guidance for OASD(NCB); providing programmatic, business, financial, and policy assessments to the OASD(NCB); Maintaining and updating OASD(NCB) related funding profiles in official DoD financial databases and systems.</p> <p>FY 2023 Plans: Continue to support the following:</p> <ul style="list-style-type: none"> - Assist with coordinating, planning and executing nuclear and conventional physical security development, test, evaluation and deployment of projects executed by the Military Departments by ensuring joint capability gaps are identified and to avoid duplication of effort across the DoD to maximize use of limited funds. - Assist Nuclear Matters and the PSEAG pursue a joint-layered defense approach to Counter-Unmanned Systems (C-UxS) by integrating sensors and systems into physical security architectures and command and control systems to address this threat. - Coordinate efforts across the DoD, interagency and international partners to develop C-UxS solutions to detect, track, identify, and defeat that support valid requirements while eliminating duplication of effort, pursuing the use of government and commercial off-the-shelf (GOTS/COTS) products, ensuring systems integration, and promoting interoperability and sustainability. - Support all phases of the PPBE process and meet all mandated timelines for submission of related documents; contribute to the development of PPBE policy guidance for OASD(NCB); providing programmatic, business, financial, and policy assessments to the OASD(NCB); Maintaining and updating OASD(NCB) related funding profiles in official DoD financial databases and systems. <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2022 to FY 2023 increase supports requirements for expected contract escalation costs, otherwise, there is no significant programmatic increase.</p>			
<p>Title: Nuclear Deterrent Enterprise Review Group (NDERG)</p> <p>Description: Beginning in FY 2022, the NDERG was moved under the purview of the NWC. The NDERG is the principal integrated civilian-military governance body for the Department of Defense (DoD) Nuclear Enterprise. This oversight body, chaired by the Deputy Secretary of Defense, and including the Vice Chairman of the Joint Chiefs of Staff and other senior leaders across the Department of Defense nuclear enterprise, was created to oversee and make decisions regarding implementation of recommendations from both the internal and external DoD nuclear enterprise reviews. The NDERG, in FY 2019, expanded its responsibility to provide advice and assistance to the Deputy Secretary of Defense on matters pertaining to management, operations, and health of the DoD Nuclear Enterprise. In addition, the NDERG will provide a forum for strategic-level coordination and integration of issues arising from the Department's other functional oversight committees and councils related to the nuclear enterprise.</p>		0.750	-

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Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605161D8Z / <i>Nuclear Matters - Physical Security</i>	Project (Number/Name) 161 / <i>Nuclear Matters</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
The NDERG meets on a biennial basis and provides a forum for senior Defense leaders to identify, track, coordinate, and address issues, risks, and opportunities across the nuclear enterprise to ensure that outcomes of the 2014 Nuclear Enterprise Reviews, and outcomes of 2018 Nuclear Posture Review related to the health, management, and operations of the DoD Nuclear Enterprise, are pursued to completion.				
<p>Title: Nuclear Incident Response and North Atlantic Treaty Organization (NATO)</p> <p>Description: In accordance with Presidential Policy Directive 35, US Nuclear Weapons Command and Control, Safety and Security and the DoD implementer, DoDD S-5210.81, the DoD will establish policy on nuclear weapons procedures for responding to U.S. nuclear weapons accidents and incidents and serve as the technical advisor to the Secretary of Defense in the event of a nuclear accident or incident. Coordinates with other U.S. Government Agencies and allies to ensure their standards complement DoD efforts for responding to accidents and incidents.</p> <p>Regularly consult with NATO allies through the High Level Group, which is the senior advisory body to the NATO Nuclear Planning Group, consisting of subject matter experts and supporting the Assistant Secretary of Defense for nuclear, Chemical and Biological Defense in their role as Vice-Chair of the HLG. The HLG is comprised of national policy makers and experts from Allied partners.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> - Served as Chair of the Nuclear Weapons Accident and Incident Subcommittee tasked in Federal response plans and national directives with the responsibility to coordinate and execute U.S. nuclear weapons incident and accident response policy. - Coordinated overseas nuclear weapon storage and deployment issues with the Department of State, Combatant Commands, Services, and other DoD organizations. - Executed Nuclear Weapon Accident and Incident Exercises for the DoD, in coordination and cooperation with other U.S. Government Agencies (to include state/local/tribal) and NATO Partners. <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue to Serve as Chair of the Nuclear Weapons Accident and Incident Subcommittee tasked in Federal response plans and national directives with the responsibility to coordinate and execute U.S. nuclear weapons incident and accident response policy. - Continue to coordinate overseas nuclear weapon storage and deployment issues with the Department of State, Combatant Commands, Services, and other DoD organizations. - Continue Nuclear Weapon Accident and Incident Exercises for the DoD, in coordination and cooperation with other U.S. Government Agencies (to include state/local/tribal) and NATO Partners. <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>		0.750	0.750	0.750

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605161D8Z / <i>Nuclear Matters - Physical Security</i>	Project (Number/Name) 161 / <i>Nuclear Matters</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
There is no change between FY 2022 and FY 2023.				
Title: Nuclear Deterrent Model Description: In order to overcome evolving threats to the U.S. nuclear deterrent, the NWC must understand the trade space, benefits, challenges, and increases or decreases in effectiveness related to decisions regarding nuclear warheads and their associated delivery systems and platforms. Nuclear Matters is leading a series of efforts to provide data-driven decision making support to NWC decision makers with threat-informed choices regarding U.S. nuclear deterrent modernization and sustainment. FY 2022 Plans: - Leveraged the nuclear deterrent model with analysis results that respond to the Nuclear Weapons Council in support of their strategic planning to include modernization strategies and stockpile composition assessments and investment trade offs. - Utilized the model to develop stockpile options, provide data to drive decisions concerning nuclear weapons program prioritization, and evaluate the capacity of the NNSA Nuclear Security Enterprise to support DoD military requirements. FY 2023 Plans: - Leverage the nuclear deterrent model with analysis results that respond to the Nuclear Weapons Council in support of their strategic planning to include modernization strategies and stockpile composition assessments and investment trade offs. - Utilize the model to develop stockpile options, provide data to drive decisions concerning nuclear weapons program prioritization, and evaluate the capacity of the NNSA Nuclear Security Enterprise to support DoD military requirements. FY 2022 to FY 2023 Increase/Decrease Statement: The FY 2022 to FY 2023 decrease is associated with placing additional investment in Nuclear Deterrent Integrated Data Analytics and Risk Management to respond to Nuclear Weapons Council needs.		4.200	4.850	2.000
Title: Nuclear Deterrent Integrated Data Analytics and Risk Management Description: Data driven decision making for nuclear modernization leveraging subject matter expertise across the federal government, Federally Funded Research and Development Centers, and University Affiliated Research Centers. FY 2023 Plans: Use a data-driven and threat-informed approach consistent with DoD and Presidential guidance to identify and communicate nuclear deterrent and modernization risks and exploit opportunities for efficiency and cost savings. FY 2022 to FY 2023 Increase/Decrease Statement: Data analysis requirements driven by the need for the DoD and DOE to enhance how the departments manage risk and prioritize efforts that affect the U.S. nuclear enterprise.		2.711	-	2.946
Accomplishments/Planned Programs Subtotals		16.013	14.348	15.379

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C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy N/A		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 6: RDT&E Management Support					R-1 Program Element (Number/Name) PE 0605170D8Z I Support to Networks and Information Integration (NII)							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	89.354	9.230	4.759	9.449	-	9.449	10.441	8.588	8.044	7.995	Continuing	Continuing
170: Support to NII	89.354	9.230	4.759	9.449	-	9.449	10.441	8.588	8.044	7.995	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression, Defend the Homeland, and Build Sustainable and Long-Term Advantage.

Support to Networks and Information Integration (NII) program supports Global Positioning System (GPS) User Equipment Synchronization with GPS space and operational control segments to conduct DoD CIO oversight of GPS management and planning activities required for meeting JCIDs requirements. The NII program also supports policy and guidance for incorporation of alternative means of Positioning, Navigation, and Timing (PNT) delivery to augment GPS. Additionally, the program supports the DoD's PNT Oversight Council and inputs into interagency activities under the National Space-Based Positioning, Navigation, and Timing Executive Committee.

In support of the National Defense Strategy (NDS), GPS continues to provide a force multiplier for the Joint Force and key U.S. allies. Similarly, superior PNT provides enhanced Joint Force lethality through precision targeting, exacting ISR, efficient logistics, blue force tracking, and a myriad of other force enhancements which are utilized by the Joint Force and key U.S. allies. As such, they ensure efficient and effective force employment.

The Integrated Planning and Management Project encompasses the National Leadership Command Capabilities Management Office's (NMO) responsibilities for establishing overall DoD policy and oversight with respect to the capability development, interoperability, standards, and architecture for National Command Capabilities for our Nation's Senior Leadership. The NMO serves as the single point of contact within the Department for policy, long-range plans, programs and budget, integrated mission advocacy, and management of decision-maker capabilities. NMO's objective is to ensure capabilities are in place to provide complete and timely situational awareness and decision tools for senior decision-makers. Additionally, the NMO assists the DoD CIO as the Executive Agent and primary OSD advocate for the White House Military Office with oversight of a wide range of DoD command, control, and communications (C3) assets and oversees the efforts of the Services and Agencies in the design, integration, and deployment of critical and sensitive C3 capabilities. Two overall areas of focus include: 1) National Senior Leader C3 Systems, National Security/Emergency Preparedness (NS/EP), DoD support to Civil Authorities; Continuity of Government (COG); 2) Cyber Mission Indications and Warnings.

NMO provides guidance, oversight and policy direction support for Senior Leadership communications and Continuity communications which supports the Secretary's stated priority to "Defend the Nation" by "Addressing Advanced and Persistent Threats". By coordinating and integrating with the National Security Agency in the development of a security policy that provides guidance to the NMO community on cyber secure connection interfaces and security patterns on a continuous basis to addresses hardware, firmware and software vulnerabilities. Working with Defense Information Systems Agency (DISA), the Services, and other federal

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022		
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 6: RDT&E Management Support		R-1 Program Element (Number/Name) PE 0605170D8Z I Support to Networks and Information Integration (NII)				
government agencies to ensure the safety of our Nation's critical undersea cable infrastructure. Provide guidance and oversight to all NMO cryptographic modernization programs, ensure NSA and the appropriate Service delivers their cryptographic capability on time and work with the combatant commanders' staff to ensure they have operationalized any potential risks with potential cryptographic program delays.						
Coordinate the DoD's critical time dissemination resiliency plans and initiatives with senior representatives from the precision, navigation and timing (PNT) community. Work with the Joint Staff, Army, Air Force, Navy, and Marine Corps to ensure their PNT plans include primary and alternate capabilities. Continue analysis of White House, DoD Services, DoD Agencies and Combatant Command initiatives to ensure the effectiveness of our airborne command, control and communications, commercial and military satellite communications, and their supporting ground infrastructure. Analysis will ensure our Senior Leadership C3 is operationally effective during all phases of a conflict.						
B. Program Change Summary (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget		9.582	4.759	0.000	-	0.000
Current President's Budget		9.230	4.759	9.449	-	9.449
Total Adjustments		-0.352	0.000	9.449	-	9.449
• Congressional General Reductions		-	-			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-0.002	-			
• Congressional Adds		-	-			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-0.350	-			
• Adjustments to Budget Year		-	-	9.449	-	9.449
Change Summary Explanation						
FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2021	FY 2022	FY 2023
Title: Support to Networks and Information Integration (NII)				9.230	4.759	9.449
FY 2022 Plans:						
Conduct DoD CIO oversight of GPS/PNT management and planning activities required for meeting warfighter requirements. Manage activities of the DoD PNT Oversight Council and supporting structure and support the National Space-Based Positioning, Navigation and Timing Executive Committee. Support activities include:						
- Manage the GPS Security Policy (DoDM-O4650.11).						
- Manage the Information Assurance/Communications Security (COMSEC) elements of DoDM-O4650.11.						

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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support</i>		R-1 Program Element (Number/Name) PE 0605170D8Z / <i>Support to Networks and Information Integration (NII)</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> - Continue implementation of the GPS Protection Profile matrix from Navigation Warfare Concept of Operations in conjunction with Warfighting Operations Plans (OPLANS) and Contingency Plans (CONPLANS) in coordination with United States Space Command (US SPACECOM). - Manage PNT Navigation Warfare Instruction and Annexes to all the Operations Plans (OPLANS) and Contingency Plans (CONPLANS) in coordination with United States Strategic Command (US STRATCOM). - Manage National Airspace System activities affecting PNT with the Air Force and Federal Aviation Administration. Continue implementation of Red Key Sundown Policy. - Provide staff support, perform research and conduct studies as directed by Deputy Secretary of Defense (DEPSECDEF) in his role as co-chair of the National Executive Committee for Space-Based PNT and for DoD CIO in his role as co-chair of the Executive Steering Group. - Apply Navigation Warfare Concepts of Operations via the Joint Navigation Warfare Center (JNWC) and US SPACECOM to develop Doctrine, Tactics, Techniques and Procedures, Training, Equipment Validation and Material Solutions to Navigation Warfare challenges to the Military Services and Combatant Commanders in the scenarios defined in the CONPLANS and OPLANS. - Provide oversight and guidance on the DoD PNT investment strategy to insure PNT material solutions are developed in a synchronized fashion in Joint Capabilities Integration and Development System (JCIDs), Defense Acquisition System (DAS), and Planning, Programming, Budgeting and Execution (PPBE) process. - Implement PNT Instructions (DoDIs) for PNT and Navigation Warfare policy and PNT system compliance with Navigation Warfare requirements, and the DoDM for security policy. - Analyze and promote alternative PNT delivery means for inclusion in the force structure for force protection. Assist development of Modular Open Systems Architecture Standards for fielding of alternative PNT and development of M&S tool for alternative PNT analysis. - Biennially task Intelligence Community (IC) to assess threat vectors to GPS and other means of PNT delivery; biennial operational assessments to reveal gaps in PNT delivery against OPLANS and CONPLANS of COCOMS; maintenance of PNT equipment inventories, refreshed biennially. - Develop Directives, Instructions, and Manuals for implementation of the PNT Strategy within the Department. - Continue special tasks directed by DCIO to address acceleration of development and fielding of advanced GPS receivers in the Joint Force. - Maintain and update inventory of existing GPS receiver equipage; expand to include antennae and antennae electronics; expand to include delivery of PNT via other-than-GPS equipment. - Address prioritized platforms in fielding plans and guidance to Services. - Develop Military GPS User Equipment (MGUE) "Roadmap" illustrating necessary fielding milestones for Joint Force MGUE equipage. 				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I</i> BA 6: <i>RDT&E Management Support</i>		R-1 Program Element (Number/Name) PE 0605170D8Z <i>I Support to Networks and Information Integration (NII)</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> - Administer the PNT Oversight Council and PNT Executive Management Board within DoD via supporting DoDDs and DoDIs, agendas and minutes for meetings, task disposition and the PNT Oversight Council Annual Report to Congress. Chair and manage subordinate working works (WGs) for PNT Policy and Naval Information Warfare Systems Command (NAVWAR). - Address The North Atlantic Treaty Organization (NATO) PNT interoperability via Standardization Agreement (STANAGs), Allied Navigation Plans, and associated documentation in NATO CaP-2 under C3 Board direction. Insure complementarity of allied equipage and planning based on USAF GPS development, open systems architecture development, and foreign PNT systems and capabilities. - Ensure cyber security of all elements of the Department PNT enterprise. Assist civil Departments and Agencies, as required. <p>Provide oversight and guidance on Maritime Information Systems (MIS) and Submarine Fiber Optic Cables (SFOC) and associated infrastructure. These activities will encompass overseeing analysis of requirements, identifying communications capability shortfalls and interoperability issues, assessing equipment performance issues and exploring future communications improvements. This includes technical expertise and systems engineering expertise in support of acquisition, planning, procurement, installation, operations and sustainment of MIS and SFOC capabilities.</p> <p>FY 2023 Plans: Conduct DoD CIO oversight of GPS/PNT) management and planning activities required for meeting warfighter requirements. Manage activities of the DoD PNT Oversight Council and supporting structure and support the National Space-Based Positioning, Navigation and Timing Executive Committee. Support activities include:</p> <ul style="list-style-type: none"> - Manage the GPS Security Policy (DoDM-O4650.11). - Manage the Information Assurance/COMSEC elements of DoDM-O4650.11. - Continue implementation of the GPS Protection Profile matrix from Navigation Warfare Concept of Operations in conjunction with Warfighting OPLANS and CONPLANS in coordination with US SPACECOM. - Manage PNT Navigation Warfare Instruction and Annexes to all the OPLANS and CONPLANS in coordination with US STRATCOM. - Manage National Airspace System activities affecting PNT with the Air Force and Federal Aviation Administration. Continue implementation of Red Key Sundown Policy. - Provide staff support, perform research and conduct studies as directed by DEPSECDEF in his role as co-chair of the National Executive Committee for Space-Based PNT and for DoD CIO in his role as co-chair of the Executive Steering Group. - Apply Navigation Warfare Concepts of Operations via the JNWC and US SPACECOM to develop Doctrine, Tactics, Techniques and Procedures, Training, Equipment Validation and Material Solutions to Navigation Warfare challenges to the Military Services and Combatant Commanders in the scenarios defined in the CONPLANS and OPLANS. - Provide oversight and guidance on the DoD PNT investment strategy to insure PNT material solutions are developed in a synchronized fashion in JCIDs, DAS, and PPBE. 				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support</i>		R-1 Program Element (Number/Name) PE 0605170D8Z / <i>Support to Networks and Information Integration (NII)</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> - Implement PNT DoDIs for PNT and Navigation Warfare policy and PNT system compliance with Navigation Warfare requirements, and the DoDM for security policy. - Analyze and promote alternative PNT delivery means for inclusion in the force structure for force protection. Assist development of Modular Open Systems Architecture Standards for fielding of alternative PNT and development of M&S tool for alternative PNT analysis. - Biennially task IC to assess threat vectors to GPS and other means of PNT delivery; biennial operational assessments to reveal gaps in PNT delivery against OPLANS and CONPLANS of COCOMS; maintenance of PNT equipment inventories, refreshed biennially. - Develop Directives, Instructions, and Manuals for implementation of the PNT Strategy within the Department. - Continue special tasks directed by DCIO to address acceleration of development and fielding of advanced GPS receivers in the Joint Force. - Maintain and update inventory of existing GPS receiver equipage; expand to include antennae and antennae electronics; expand to include delivery of PNT via other-than-GPS equipment. - Address prioritized platforms in fielding plans and guidance to Services. - Develop MGUE "Roadmap" illustrating necessary fielding milestones for Joint Force MGUE equipage. - Administer the PNT Oversight Council and PNT Executive Management Board within DoD via supporting DoDDs and DoDIs, agendas and minutes for meetings, task disposition and the PNT Oversight Council Annual Report to Congress. Chair and manage subordinate WGs for PNT Policy and NAVWAR. - Address NATO PNT interoperability via STANAGs, Allied Navigation Plans, and associated documentation in NATO CaP-2 under C3 Board direction. Insure complementarity of allied equipage and planning based on USAF GPS development, open systems architecture development, and foreign PNT systems and capabilities. - Ensure cyber security of all elements of the Department PNT enterprise. Assist civil Departments and Agencies, as required <p>Provide oversight and guidance on MIS and SFOC and associated infrastructure. These activities will encompass overseeing analysis of requirements, identifying communications capability shortfalls and interoperability issues, assessing equipment performance issues and exploring future communications improvements. This includes technical expertise and systems engineering expertise in support of acquisition, planning, procurement, installation, operations and sustainment of MIS and SFOC capabilities.</p> <p>Provide technical expertise and oversight of Senior Leader C3 Systems and platforms including fixed and mobile communications capabilities of the White House, Secretary of Defense, Chairman of the Joint Chiefs of Staff, and other identified Senior Leaders. These activities will encompass consolidating Senior Leader operational mission requirements, identifying communications</p>				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I</i> BA 6: <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605170D8Z <i>I Support to Networks and Information Integration (NII)</i>			
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
capability shortfalls and interoperability issues, assessing equipment performance issues and exploring future communications improvements.				
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> The FY 2023 increase is due to re-phasing based on prior year execution balances.				
Accomplishments/Planned Programs Subtotals		9.230	4.759	9.449
D. Other Program Funding Summary (\$ in Millions) N/A				
Remarks				
E. Acquisition Strategy N/A				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support					PE 0605200D8Z / General Support to OUSD(I)							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	28.396	7.904	10.452	6.112	-	6.112	6.461	6.572	6.724	6.812	Continuing	Continuing
200: General Support to USDI	28.396	7.904	10.452	6.112	-	6.112	6.461	6.572	6.724	6.812	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Defend the Homeland, Build Sustainable and Long-Term Advantage, and Taking Care of People.

Security Activities focus on technology development, automation, and modernization of capabilities across the Defense Security Enterprise to include Personnel Vetting, Physical Security, Industrial Security, and Critical Technology Protection. Activities also include proof of concept and application development related to enabling process improvement, efficiencies, and innovation.

Intelligence, Surveillance, Reconnaissance (ISR) Operations requires expert engineering and technical assessments on a wide range of classified ISR operational capabilities that directly support NDS priorities. In addition, senior level education is provided for better understanding to make informed decisions on ISR operations related initiatives, platforms, sensors and force structure. Establishes and assesses oversight of the DoD ISR enterprise. Evaluates ISR enterprise performance and effectiveness in terms of strategic sufficiency and alignment to the National Defense Strategy and monitors allied and partner ISR contributions. Provides expertise on matters of technical collection and operational employment. Provides ISR guidance, counsel, and options to national leaders on improving the near-term efficiency and effectiveness of ISR capabilities by spearheading the expedited delivery of ISR systems, technologies, policies, and processes in support of warfighter operations around the globe.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	7.904	1.952	0.000	-	0.000
Current President's Budget	7.904	10.452	6.112	-	6.112
Total Adjustments	0.000	8.500	6.112	-	6.112
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	8.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Year	-	-	6.112	-	6.112

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605200D8Z I <i>General Support to OUSD(I)</i>	

<p><u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u></p> <p>Project: 200: <i>General Support to USDI</i></p> <p style="padding-left: 40px;">Congressional Add: <i>Program Increase - Applied Research Laboratory for Intelligence and Security</i></p> <p style="text-align: right; padding-right: 100px;">Congressional Add Subtotals for Project: 200</p> <p style="text-align: right; padding-right: 100px;">Congressional Add Totals for all Projects</p> <p><u>Change Summary Explanation</u></p> <p>FY 2022 \$8.5M Congressional Add for Applied Research Laboratory for Intelligence and Security.</p> <p>FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.</p>	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="padding: 5px;">FY 2021</th> <th style="padding: 5px;">FY 2022</th> </tr> <tr> <td style="padding: 5px;">6.000</td> <td style="padding: 5px;">8.500</td> </tr> <tr> <td style="padding: 5px;">6.000</td> <td style="padding: 5px;">8.500</td> </tr> <tr> <td style="padding: 5px;">6.000</td> <td style="padding: 5px;">8.500</td> </tr> </table>	FY 2021	FY 2022	6.000	8.500	6.000	8.500	6.000	8.500
FY 2021	FY 2022								
6.000	8.500								
6.000	8.500								
6.000	8.500								

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605200D8Z / General Support to OUS D(I)				Project (Number/Name) 200 / General Support to USDI			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
200: General Support to USDI	28.396	7.904	10.452	6.112	-	6.112	6.461	6.572	6.724	6.812	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Security Activities focus on technology development, automation, and modernization of capabilities across the Defense Security Enterprise to include Personnel Vetting, Physical Security, Industrial Security, and Critical Technology Protection. Activities also include proof of concept and application development related to enabling process improvement, efficiencies, and innovation.

Intelligence, Surveillance, Reconnaissance (ISR) Operations requires expert engineering and technical assessments on a wide range of classified ISR operational capabilities that directly support NDS priorities. In addition, senior level education is provided for better understanding to make informed decisions on ISR operations related initiatives, platforms, sensors and force structure. Establishes and assesses oversight of the DoD ISR enterprise. Evaluates ISR enterprise performance and effectiveness in terms of strategic sufficiency and alignment to the National Defense Strategy and monitors allied and partner ISR contributions. Provides expertise on matters of technical collection and operational employment. Provides ISR guidance, counsel, and options to national leaders on improving the near-term efficiency and effectiveness of ISR capabilities by spearheading the expedited delivery of ISR systems, technologies, policies, and processes in support of warfighter operations around the globe.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: General Spt to USDI	1.904	1.952	6.112
Description: Security Activities focus on technology development, automation, and modernization of capabilities across the Defense Security Enterprise to include Personnel Vetting, Physical Security, Industrial Security, and Critical Technology Protection. Activities also include proof of concept and application development related to enabling process improvement, efficiencies, and innovation.			
Intelligence, Surveillance, Reconnaissance (ISR) Operations requires expert engineering and technical assessments on a wide range of classified ISR operational capabilities that directly support NDS priorities. In addition, senior level education is provided for better understanding to make informed decisions on ISR operations related initiatives, platforms, sensors and force structure.			
FY 2022 Plans: Security Activities will provide technology development and concept evaluation for applications in support of OUSD(I&S).			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605200D8Z / General Support to OUS D(I)	Project (Number/Name) 200 / General Support to USDI	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>ISR Ops will provide expert engineering and technical assessments on a wide range of classified ISR operational capabilities that directly support NDS priorities. Funds will support senior level education and understanding to inform decisions on ISR operations related initiatives, platforms, sensors and force structure.</p> <p>FY 2023 Plans: Security Activities will continue to provide technology development and concept evaluation for applications in support of OUSD(I&S).</p> <p>ISR Ops will continue to provide expert engineering and technical assessments on a wide range of classified ISR operational capabilities that directly support NDS priorities. Funds will support senior level education and understanding to inform decisions on ISR operations related initiatives, platforms, sensors and force structure.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increase due to Congressional Add.</p>			
Accomplishments/Planned Programs Subtotals		1.904	1.952
		FY 2021	FY 2022
Congressional Add: Program Increase - Applied Research Laboratory for Intelligence and Security		6.000	8.500
FY 2021 Accomplishments: Initiate development of innovative technologies and solutions to enhance Federal Vetting Enterprise and protection of critical technologies. This will be done in conjunction with interagency partners leveraging University Affiliated Research Center (UARC).			
FY 2022 Plans: Continue development of innovative technologies and solutions to enhance Federal Vetting Enterprise and protection of critical technologies. This will be done in conjunction with interagency partners leveraging University Affiliated Research Center (UARC).			
Congressional Adds Subtotals		6.000	8.500
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support	R-1 Program Element (Number/Name) PE 0605502D8Z / Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR)
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	156.944	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	-	-
502: SBIR	-	90.501	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	-	-
500: STTR	-	20.976	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	-	-
503: SBIR CRP	-	40.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	-	-
505: SBIR Administration	-	5.467	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

DoD Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs are designed to provide small, high-tech businesses opportunities to propose innovative ideas and solutions in response to technological challenges posed by the DoD Components that will address existing and emerging national security threats and to develop new military capabilities. The SBIR and STTR programs are critical pathways for the Department to tap the innovation of America's small business community and research institutions to support development of cutting-edge technologies that will increase the readiness, modernization and lethality of the Joint Force.

B. Program Change Summary (\$ in Millions)

	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	156.944	0.000	0.000	-	0.000
Total Adjustments	156.944	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	156.944	-			

Change Summary Explanation

Funds are allocated from other Office of the Secretary of Defense (OSD) Research, Development, Test, and Evaluation (RDT&E) programs and select Defense Agencies to support the SBIR and STTR programs as defined in 15 U.S.C. 638 (f) and (n).

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605502D8Z / <i>Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR)</i>				Project (Number/Name) 502 / <i>SBIR</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
502: <i>SBIR</i>	-	90.501	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The goals of the Office of the Secretary of Defense (OSD) Small Business Innovation Research (SBIR) program is to stimulate technological innovation, increase private sector commercialization of federal research and development (R&D), increase small business participation in federally funded R&D, and foster participation by minority and disadvantaged firms in technological innovation. Leveraging the innovation of small business concerns is an important contributor to the development of the cutting-edge technologies that will generate decisive and sustained U.S. military advantages by increasing the readiness, modernization and lethality of the Joint Force. This program supports high priority projects within the DoD Components, their missions, and the Warfighter.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: SBIR	90.501	-	-
Description: The set-aside program for small business supports mission-oriented R&D with the goal of providing advanced capabilities to the Warfighter and commercializing those technologies, resulting in a vibrant small business innovation base supporting economic growth and technology innovation.			
<p>The SBIR program contributed to the readiness and modernization of the Joint Force and improved operational capabilities through the innovative research topics initiated in FY 2022 in the following areas:</p> <p>OSD-NGA:</p> <ul style="list-style-type: none"> - Scene Geometry Aided Automatic Target Recognition (ATR) for Radar, develop and demonstrate synthetic aperture radar (SAR) ATR that reduces false alarm rates by incorporating modern artificial intelligence and geometry of the imaged area. <p>TECHNOLOGY AREA(S): Artificial Intelligence/Machine Learning (AI/ML); Autonomy; Information Systems; Sensors; Electronics</p> <ul style="list-style-type: none"> - Automatic Labeling of Multiple Target Synthetic Aperture Radar (SAR) Imagery for Automatic Target Recognition (ATR), develop novel algorithms for labeling multiple target classes in Synthetic Aperture Radar (SAR) imagery to expedite training of SAR Automatic Target Recognition (ATR) algorithms. <p>TECHNOLOGY AREA(S): Artificial Intelligence/Machine Learning (AI/ML); Autonomy; Information Systems; Sensors; Electronics</p> <ul style="list-style-type: none"> - Rapid Object Detector Development from Limited Labelled Data, develop methods and science to rapidly produce object detectors for overhead imagery starting from a limited pool of hand-labeled data. <p>TECHNOLOGY AREA(S): Artificial Intelligence / Machine Learning; Information Systems Technology .- Modeling and Simulation Technology; Computing and Software Technology</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605502D8Z / <i>Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR)</i>	Project (Number/Name) 502 / <i>SBIR</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>- High Resolution Near Real Time Land Use and Land Use Change, develop a high-resolution fully automated land use and land use change (LULUC) map of the globe, updated daily, using commercial or publicly available satellite imagery. Identify mission-specific types of change in near real-time across broad areas. TECHNOLOGY AREA(S): Artificial Intelligence/Machine Learning Information Systems; Modeling and Simulation Technology</p> <p>OSD-C5ISREW:</p> <p>- Stand-alone multi-axis compact portable quantum accelerometer, build a compact portable 3-axis quantum-based accelerometer and demonstrate on a moving platform. TECHNOLOGY AREA(S): Quantum Science; Sensors; Electronics and Electronic Warfare</p> <p>- High yield atomic vapor cell manufacturing and packaging for atomic clocks and magnetometers, develop a manufacturing process which allows greater yield (>80%) per wafer batch on vapor cell wafer runs to support quantum clocks and magnetometers. TECHNOLOGY AREA(S): Quantum Science; Sensors; Electronics and Electronic Warfare; Materials / Processes</p> <p>- Networked quantum sensor for geolocation of anomalous underground ferrous sources, detect and geo-locate subterranean tunneling activities by using a quantum networked magnetometer. TECHNOLOGY AREA(S): Quantum Science; Sensors; Electronics and Electronic Warfare</p> <p>- Open environment nuclear quadrupole magnetic resonance detection, develop a quantum magnetometer that is widely tunable between 100 Hz and 10 MHz to detect and distinguish RF signals with sensitivity near 1 fT/Hz^{1/2}. TECHNOLOGY AREA(S): Quantum Science; Sensors; Electronics and Electronic Warfare</p> <p>Emerging results from these SBIR topics will be reported in FY 2023.</p>			
Accomplishments/Planned Programs Subtotals		90.501	-
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605502D8Z / Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR)				Project (Number/Name) 500 / STTR			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
500: STTR	-	20.976	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The goals of the OSD Small Business Technology Transfer (STTR) program is to stimulate a partnership of ideas between small business concerns (SBCs) and research institutions through DoD funded research or research and development (R/R&D). By providing awards to SBCs or cooperative R/R&D efforts with research institutions, DoD supports innovation and economic growth to generate decisive and sustained U.S. military advantages. This program supports high priority projects within the DoD Components, their missions, and the Warfighter.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: STTR									20.976	-	-	
Description: The set-aside program that funds cooperative R/R&D projects for small businesses in partnership with research institutions. The STTR program contributed to the readiness and modernization of the Joint Force and improved operational capabilities through the innovative research topics initiated in FY 2022 in the following areas: OSD-NGA: - Multi-Scale Representation Learning, develop a single neural network that learns representations at multiple spatial and semantic scales and that may be applied to different geospatial tasks, such as land cover segmentation, object detection, key-point matching, and few-shot/fine-grained/long-tailed classification. TECHNOLOGY AREA(S): Artificial Intelligence/Machine Learning; Information Systems; Modeling and Simulation Technology - Environmental Security Risk Forecasting, develop computer models to forecast risk to U.S. critical infrastructure from a range of potential climate futures. During Phase I, research will be restricted to modeling past and forecasting future wildfire potential in a chosen area containing critical infrastructure. TECHNOLOGY AREA(S): Artificial Intelligence/Machine Learning; Statistical Forecasting; Information Systems; Modeling and Simulation Technology Emerging results from these STTR topics will be reported in FY 2023.												
Accomplishments/Planned Programs Subtotals									20.976	-	-	
C. Other Program Funding Summary (\$ in Millions)												
N/A												

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605502D8Z / <i>Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR)</i>	Project (Number/Name) 500 / STTR
C. Other Program Funding Summary (\$ in Millions)		
Remarks		
D. Acquisition Strategy		
N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605502D8Z / <i>Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR)</i>	Project (Number/Name) 503 / <i>SBIR CRP</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
503: <i>SBIR CRP</i>	-	40.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Under the authority defined in 15 U.S.C. 638 (y), Commercialization Readiness (CR) Program (CRP), OSD established the “OSD Transitions SBIR/STTR Technology (OTST) Program”. The CR Program is a dynamic, results-oriented response to the Congressional challenge to the DoD in 2006 to deliver more advanced SBIR/STTR technologies faster to our warfighters. The OTST program is an interim technology maturity phase (Phase II) inserted into the SBIR/STTR development process and is structured to be a technology pull to meet requirements that address potential and emerging requirements.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Commercialization Readiness Program (CRP)	40.000	-	-
Description: The SBIR CR Program contributed to the readiness and modernization of the Joint Force and improved operational capabilities through innovative research projects in the following areas: <ul style="list-style-type: none"> • Artificial Intelligence • Biotechnology • COVID-19 • Cybersecurity • General Warfighting Capability • Hypersonics • Sustainment <p>Emerging Results from CRP Investments in FY 2021 include:</p> <ul style="list-style-type: none"> • Air Force- Precision Automated Instrumented Landing Survey; "Active Collaborative Automatic ATR (ACA); Automatic Target Recognition (ATR)", Joint Collaborative Augmentation for Sensemaking Environment (JCAUSE); Advanced Energy Deposition Systems for High Speed Flight; Turbojet-Ramjet Integration for a Turbine-based Combined Cycle Engine; Active Control of a Scramjet Engine; Free Flight Hypersonic Erosion and Ablation Measurement System / 3D Hypersonic Surface Profilometry Measurement System ; Portable Kinetic Metallization Process and Device for Minor Structural and Protective Coating Repair of Aluminum and High-Strength Steels; NDI Tool for Corrosion Detection in Sub-Structure • ARMY- "Human Activity Recognition (HAR) and Threat Assessment Via Passive Sensor Systems for Small Arms" • DEVCOM- "An Accurate Unsteady Hybrid Flowfield Approach for High Altitude Maneuverability" 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605502D8Z / <i>Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR)</i>	Project (Number/Name) 503 / <i>SBIR CRP</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> • DIU- Sustainment and Fleet Readiness at Scale; Hypoxia - Pilot Health and Physiological Monitoring in Next-Generation Helmet Architectures; Wearable Warfighter Health Monitoring System; Passenger Mixed Reality Deep Immersion Headset; • DLA- Decoder Wheel Phase 2 Development; Reverse Engineering of CCA's for DSM-157 Maverick Missile Test Set (AGM-65); Auxiliary Power Supply for Aerospace Hydraulic Systems; MMP APA Replacement and Refurbishment and Supply Chain Development • DMEA- "Prognostics and Decision Making – AI Anti-Tamper Technology for Missile Defense - Micro" • JSSAP- Propellant Material Additives for Electrical Ignition Application • MDA- Special Tooling and Processes for Repeatable Adhesive Application • NAVY- Enhanced Summarizations of Streaming Text - (Microservices for Semantics, Text Analytics and Reporting (MSTAR)) <p>In FY 2023, CRP intends on funding 35-40 additional projects.</p>			
Accomplishments/Planned Programs Subtotals		40.000	-
C. Other Program Funding Summary (\$ in Millions) N/A Remarks D. Acquisition Strategy N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605502D8Z / <i>Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR)</i>				Project (Number/Name) 505 / <i>SBIR Administration</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
505: <i>SBIR Administration</i>	-	5.467	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The goals of the Office of the Secretary of Defense (OSD) Small Business Innovation Research (SBIR) program is to stimulate technological innovation, increase private sector commercialization of federal research and development (R&D), increase small business participation in federally funded R&D, and foster participation by minority and disadvantaged firms in technological innovation. Leveraging the innovation of small business concerns is an important contributor to the development of the cutting-edge technologies that will generate decisive and sustained U.S. military advantages by increasing the readiness, modernization and lethality of the Joint Force. This program supports high priority projects within the DoD Components, their missions, and the Warfighter. The SBIR Administration project was created to fund, coordinate, and execute the administrative portions of the DoD SBIR Programs.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Title: SBIR Administration	5.467	-	-
Description: The Small Business Innovation Research (SBIR) set-aside program supports mission-oriented R&D with the goal of providing advanced capabilities to the Warfighter and commercializing those technologies, resulting in a vibrant small business innovation base supporting economic growth and technology innovation. The SBIR Administration project was created to fund, coordinate, and execute the administrative portions of the DoD SBIR Program.			
Accomplishments/Planned Programs Subtotals	5.467	-	-

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support					PE 0605790D8Z / Small Business Innovation Research (SBIR) Small Business Technology Transfer (STTR)							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	3.582	3.628	3.820	0.000	3.820	3.899	3.959	4.042	4.123	Continuing	Continuing
518: SBIR Challenge Admin	-	3.582	3.628	3.820	0.000	3.820	3.899	3.959	4.042	4.123	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Build Sustainable and Long-Term Advantage, and Taking Care of People.

This program element (PE) provides funding for the administration of the Department of Defense (DoD) Small Business Innovation Research (SBIR) program and the Small Business Technology Transfer (STTR) program. The authority to establish SBIR and STTR programs is codified in 15 U.S.C. 638. The statutory goals of the programs are to stimulate technological innovation, meet federal research and development (R&D) needs, foster and encourage participation in innovation and entrepreneurship by women and socially or economically disadvantaged persons, and increase private sector commercialization of innovations from federal R&D funding. In addition, the STTR program aims to foster technology transfer through cooperative R&D between small businesses and research institutions.

The DoD SBIR/STTR programs set-aside almost two billion dollars annually defense-wide to competitively fund scientific and technical innovation to specifically address the National Defense Strategy (NDS) modernization priorities and the mission needs of participating DoD components. The DoD components participating in the SBIR/STTR programs include: Army, Navy, Air Force, Defense Advanced Research Projects Agency (DARPA), Missile Defense Agency (MDA), Defense Threat Reduction Agency (DTRA), U.S. Special Operations Command (SOCOM), Joint Science & Technology Office for Chemical & Biological Defense (CBD), National Geospatial-Intelligence Agency (NGA), Defense Logistics Agency (DLA), Defense Microelectronics Activity (DMEA), Defense Health Agency (DHA), Strategic Capabilities Office (SCO), Defense Human Resources Activity (DHRA), Space Development Agency (SDA), and the Office of Secretary of Defense (OSD).

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support	R-1 Program Element (Number/Name) PE 0605790D8Z / Small Business Innovation Research (SBIR) Small Business Technology Transfer (STTR)
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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	3.582	3.639	0.000	0.000	0.000
Current President's Budget	3.582	3.628	3.820	0.000	3.820
Total Adjustments	0.000	-0.011	3.820	0.000	3.820
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Year	-	-	3.688	-	3.688
• Economic Assumption	-	-	0.132	-	0.132
• FFRDC	-	-0.011	-	-	-

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605790D8Z / Small Business Innovation Research (SBIR) Small Business Technology Transfer (STTR)				Project (Number/Name) 518 / SBIR Challenge Admin			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
518: SBIR Challenge Admin	-	3.582	3.628	3.820	0.000	3.820	3.899	3.959	4.042	4.123	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Small Business Innovation Research (SBIR) program and the Small Business Technology Transfer (STTR) programs are highly competitive programs that encourage domestic small businesses to engage in federal research, development, test and evaluation (RDT&E) with the potential for commercialization. Through a competitive awards-based program, SBIR/STTR enables small businesses to explore their technological potential and provide the incentive to profit from its commercialization. By including qualified small businesses in the nation's research and development (R&D) arena, high-tech innovation is stimulated, and the United States gains entrepreneurial spirit as it meets specific research and development needs.

The SBIR/STTR programs are executed in three phases. The purpose of Phase I is to determine the scientific technical and commercial merit, and feasibility of ideas submitted under the SBIR/STTR programs. Phase II is the principal research or research and development effort and is expected to produce a well-defined deliverable prototype. Phase III SBIR/STTR efforts derive from, extend or conclude Phase I or Phase II efforts, and are not funded with SBIR/STTR funds. Under Phase III, companies participating in the SBIR/STTR programs are expected to obtain funding from the private sector and/or non-SBIR/non-STTR government sources to develop the prototype into a viable product or non-R&D service for sale in military and/or private sector markets.

This PE funds the administrative support to the SBIR/STTR programs including: policy development, oversight of program execution for participating DoD agencies, outreach to small businesses, Impact Level IV (IL4) environment hosting/operation and maintenance for the Defense SBIR/STTR Innovation Portal (DSIP), and conduct of a virtual symposium to better communicate the DoD mission and technology needs to small businesses.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: SBIR Challenge Admin	3.582	3.628	3.820
Description: This program element is the only source of funds for the coordination, administration and execution of the Department's SBIR/STTR programs in accordance with statute, SBA SBIR/STTR Policy Directive, and the DoD policies and regulations. The Director, Small Business and Technology Partnerships (SBTP) is tasked with oversight and execution of essential SBIR/STTR Program activities that are required by law.			
FY 2022 Plans: <ol style="list-style-type: none"> (1) Continue coordination and execution of the administrative responsibilities of the DoD SBIR/STTR programs; (2) Refine and improve established automated processes across the entire SBIR/STTR lifecycle; (3) Re-evaluate and expand upon existing outreach programs; 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605790D8Z / <i>Small Business Innovation Research (SBIR) Small Business Technology Transfer (STTR)</i>	Project (Number/Name) 518 / <i>SBIR Challenge Admin</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>(4) Continue oversight, collection of results, tracking execution and reporting of Phase II technology transition results from the DoD SBIR Commercialization Readiness Program (CRP); and</p> <p>(5) Prepare and respond to required reports mandated by law and policy.</p> <p>FY 2023 Plans:</p> <p>(1) Continue coordination and execution of the administrative responsibilities of the DoD SBIR/STTR programs;</p> <p>(2) Refine and improve established automated processes across the entire SBIR/STTR lifecycle;</p> <p>(3) Re-evaluate and expand upon existing outreach programs;</p> <p>(4) Continue oversight, collection of results, tracking execution and reporting of Phase II technology transition results from the DoD SBIR Commercialization Readiness Program (CRP); and</p> <p>(5) Prepare and respond to required reports mandated by law and policy.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p> <p>There are no significant changes between FY 2022 and FY 2023</p>			
Accomplishments/Planned Programs Subtotals		3.582	3.628
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support	R-1 Program Element (Number/Name) PE 0605797D8Z / Maintaining Technology Advantage
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	20.244	24.735	26.807	35.414	-	35.414	36.211	36.450	34.681	35.878	-	-
043: Technology Innovation Base	0.000	3.624	7.930	17.260	-	17.260	15.276	15.895	14.676	15.473	-	-
138: S&T Protection	9.230	8.793	6.344	5.740	-	5.740	7.809	7.610	7.285	7.431	-	-
139: Joint Acquisition Protection Exploitation Cell (JAPEC)	5.379	6.508	6.512	6.953	-	6.953	7.771	7.666	7.643	7.795	-	-
158: Program and Technology Protection	5.635	5.810	6.021	5.461	-	5.461	5.355	5.279	5.077	5.179	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Build Sustainable and Long-Term Advantage, and Build a Resilient Joint Force and Defense Ecosystem.

This Program Element provides funding to support efforts to maintain the Department of Defense's (DoD)'s technology advantage. Maturing and implementing the Office of the Under Secretary of Defense (Research and Engineering)'s (OUSD(R&E)) technology priorities requires a healthy and capable National Security Innovation Base (NSIB). Additionally, the targeting of U.S. capabilities by our strategic competitors creates the potential to degrade core U.S. military technological advantages through unwanted technology transfer from the innovation base. The technology transfer, including unclassified technology, threatens DoD's ability to maintain the technology advantage required to support the lethality and survivability of the Joint Force.

The DoD is executing a plan to maintain DoD's technology advantage:

- (1) The DoD is promoting strategic technology investments to promote and protect DoD access to new and innovative technology. These investments provide OUSD(R&E)'s ability to determine strategies for future investments to establish and maintain a robust academic and industrial base capable of creating breakthroughs in key areas of basic research, fostering transition and decreasing time to market, and harvesting technologies within the U.S. innovation ecosystem or with likeminded allies.
- (2) Ensure the Department's strategic technology investments are protected against unwanted technology transfer by developing and maintaining the tools and techniques that enable the U.S. engage in technology transfer at the time, place, and parties of our choosing.
- (3) The DoD must combat adversaries' attempts to thwart the U.S. NSIB and associated technology security mechanisms to control technology transfer.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I</i> BA 6: <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605797D8Z <i>I Maintaining Technology Advantage</i>	

The Department will support these three efforts by developing the appropriate suite of analytic tools, a data acquisition strategy, and protection activities across the science and technology (S&T) enterprise and programs to address the threat over the long term. S&T protection focuses on ensuring the integrity of the research enterprise through development of policy and conducting adequate due diligence on researchers. Program Protection Planning includes protection of critical program information, critical components and mission functions, and integrates high level security policies and practical expertise to specific RDA practices, systems engineering activities, secure cyber resilient engineering activities, software assurance activities and risk reduction activities. Through this initiative the Department is maturing system security engineering methodologies to protect controlled unclassified information, to include controlled technical information on contractor networks; improve mitigation of supply chain risk management risks; enhance the use of software assurance capability; improve integration of cybersecurity into the engineering processes through secure cyber resilient engineering; mature processes to identify Critical Program Information integration of defense exportability features; expand software assurance capabilities provided by the Joint Federated Assurance Center (JFAC), established in Sec 937 of the National Defense Authorization Act (NDAA) for 2014; and improve program protection planning. FY 2021 and FY 2022 program growth adds the Technology Innovation Base (TIB) effort to develop near- and long-term strategies and employs mechanisms to retain the U.S. advantage in current and emerging modernization technology priorities by addressing the capabilities of the innovation base to develop, test, manufacture, and sustain them. This project provides support to technology priority leaders in identifying innovation base needs; characterizing and assessing priority technology investments, identifying and mitigating issues and risks impacting the innovation base, and exploiting opportunities to advance technology development, testing, and manufacturing.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	25.561	25.889	0.000	-	0.000
Current President's Budget	24.735	26.807	35.414	-	35.414
Total Adjustments	-0.826	0.918	35.414	-	35.414
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	1.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.821	-			
• Other reprogramming	-0.005	-	-	-	-
• FFRDC	-	-0.082	-	-	-
• Adjustments to Budget Year	-	-	28.263	-	28.263
• Economic Assumption	-	-	1.010	-	1.010
• INV-001 Underexecution Review	-	-	-2.959	-	-2.959
• Defense Advanced Battery Supply Chain	-	-	2.600	-	2.600
• Distributed Manufacturing Enabled by Modular Bioindustrial and Reusable (MEMBR) Assets	-	-	4.500	-	4.500

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022		
Appropriation/Budget Activity		R-1 Program Element (Number/Name)				
0400: Research, Development, Test & Evaluation, Defense-Wide I BA 6: RDT&E Management Support		PE 0605797D8Z I Maintaining Technology Advantage				
• Hypersonic Weapons Components		-	-	2.000	-	2.000
Congressional Add Details (\$ in Millions, and Includes General Reductions)					FY 2021	FY 2022
Project: 043: Technology Innovation Base						
Congressional Add: Securing American Science and Technology Program					-	1.000
Congressional Add Subtotals for Project: 043					-	1.000
Congressional Add Totals for all Projects					-	1.000
Change Summary Explanation						
FY 2023 funding increase reflects the fact that the FY 2022 President’s Budget request did not include out-year funding.						
The FY 2023 funding request was reduced by \$2.959 million to account for the availability of prior year execution balances.						

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605797D8Z / Maintaining Technology Advantage				Project (Number/Name) 043 / Technology Innovation Base			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
043: Technology Innovation Base	0.000	3.624	7.930	17.260	-	17.260	15.276	15.895	14.676	15.473	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Technology Innovation Base (TIB) effort develops near- and long-term strategies and employs mechanisms to retain the U.S. advantage in current and emerging modernization technology priorities by addressing the capabilities of the innovation base to develop, test, manufacture, and sustain them. This project provides support to technology priority leaders in identifying innovation base needs; characterizing and assessing priority technology investments, identifying and mitigating issues and risks impacting the innovation base, and exploiting opportunities to advance technology development, testing, and manufacturing. One of TIB's main objectives is to create balance between promotion of the innovation base while protecting the technology from interference or exploitation by competitors. This balance will aid the Department's advancing critical and emergent technologies ahead of competitor nations and actors while sustaining a healthy, resilient, and globally competitive innovation base. This portfolio of activity extends efforts initiated in response to FY 2019 National Defense Authorization Act (NDAA) Section 1793.

This project uses a three-step approach: (1) Assess, (2) Protect/Promote; and (3) Monitor. In the first step, TIB uses emerging technology assessments to translate technology needs to manufacturing and innovation base requirements in order to identify innovation base issues, risks, and opportunities. TIB created an assessment methodology that incorporates four types of studies to provide a full overview of the technology from a manufacturing and innovation base point of view. The results of the assessments are used to generate innovation-base inputs to technology roadmaps, develop an investment plan addressing the needs of the innovation base, and create technology and innovation base protection and promotion strategies (second step of the approach). TIB leverages DoD and Federal Government tools and initiatives to implement the strategies. In the third step, TIB uses data analytics to measure the success of mitigation and exploitation strategies, establish trends in the markets, and identify the need for additional assessments or changes in investments and strategies. For technology protection, TIB manages the Office of the Under Secretary of Defense (Research and Engineering) (OUSD(R&E)) responsibilities for the Committee on Foreign Investment in the United States (CFIUS) reviews. TIB does the initial screening of all CFIUS cases to determine OUSD(R&E) equities and request subject matter experts review in foreign acquisition transactions with a potential negative impact to national security. TIB is the focal point for OUSD(R&E) export control activities. TIB manages the activities necessary to provide technical advice to the Defense Technology Security Administration regarding export control regulations and license review policy. This includes prioritization of critical technologies for inclusion in the Commerce Control List and the U.S. Munitions List and the processing of export license applications involving emergent technologies.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Technology Innovation Base	3.624	6.930	17.260
FY 2022 Plans:			
• Create and implement short-term and long-term strategies to protect and maintain U.S. technology advantage by growing and retaining critical technologies and the innovation base supporting their development, test, manufacturing, and sustainment.			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605797D8Z / <i>Maintaining Technology Advantage</i>	Project (Number/Name) 043 / <i>Technology Innovation Base</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> • Industry outreach – including industry days and workshops to define requirements to advance emergent technologies through open-market models and industry-government collaboration. • Manufacturing challenges to find solutions to facilitate tech transfer from the labs to the production lines, improve manufacturing process, take advantage of new capabilities related to additive manufacturing and/or the integration of new materials. • Assess market trends and execute financial analysis to determine opportunities for US industry – competition, collaboration with allies, reduction of foreign dependencies. • Assess, promote, protect, and monitor critical technologies and their supply chain. • Manage technology innovation base assessments performed by other DoD and USG Agencies, Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Center (UARCs), or industry. • Conduct deep dive assessments in 5G, Autonomy, Cyber, Hypersonics, Biotechnology, Fully Networked Command, Control & Communications (FNC3), and Industrial Base Workforce to identify and address national security innovation base risks, issues, and opportunities related to DoD to include but not limited to: <ul style="list-style-type: none"> - Tools, technologies or techniques associated with development, testing, or manufacturing - Financial health of key industrial partners and suppliers - Workforce need for scientists, engineers, technicians - Single source materials, critical pockets of expertise, impacts to environmental events, exploitation by foreign actors to secure or deter critical elements of the innovation base • Create Technology/Innovation Base Protection strategies for each technology priority area; including management of R&E Committee on Foreign Investment in U.S. transaction, export control assessments, and intellectual property. • Monitor the defense innovation base and the performance of the protect/promote activities including CFIUS transactions and Export Control licenses. <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> • Create and implement short-term and long-term strategies to protect and maintain U.S. technology advantage by growing and retaining critical technologies and the innovation base supporting their development, test, manufacturing, and sustainment. • Conduct Industry outreach – including industry days and workshops to define requirements to advance emergent technologies through open-market models and industry-government collaboration. • Sponsor Manufacturing challenges to find solutions to facilitate tech transfer from the labs to the production lines, improve manufacturing process, take advantage of new capabilities related to additive manufacturing and/or the integration of new materials. • Assess market trends and execute financial analysis to determine opportunities for US industry – competition, collaboration with allies, reduction of foreign dependencies. • Assess, promote, protect, and monitor critical technologies and their supply chain. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605797D8Z / <i>Maintaining Technology Advantage</i>	Project (Number/Name) 043 / <i>Technology Innovation Base</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> • Manage technology innovation base assessments performed by other DoD and USG Agencies, Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Center (UARCs), or industry. • Conduct deep dive assessments to identify and address national security innovation base risks, issues, and opportunities related to DoD to include but not limited to: <ul style="list-style-type: none"> - Tools, technologies or techniques associated with development, testing, or manufacturing - Financial health of key industrial partners and suppliers - Workforce need for scientists, engineers, technicians - Single source materials, critical pockets of expertise, impacts to environmental events, exploitation by foreign actors to secure or deter critical elements of the innovation base • Create Technology/Innovation Base Protection strategies for each technology priority area; including management of R&E Committee on Foreign Investment in U.S. transaction, export control assessments, and intellectual property. • Monitor the defense innovation base and the performance of the protect/promote activities. • Identify and address new, emerging manufacturing capabilities and technology base gaps that are critical to fielding modernization priorities and other US technological advantage areas, including workforce, engineering and prototyping infrastructure and facilities. • Assessment and strategy development for the hypersonics industrial base. • Support the BioTech technology protection efforts for the Modular Bioindustrial and Reusable (MEMBR) efforts. • Conduct foundational assessments of the Defense Advanced Battery Supply Chain. <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 increase is part of the long term plan to reach capabilities to support seven assessments per year. Sustained funding level expected to be reached in FY 2024. Reflects DoD sustainment assessment funding level to identify and address new, emerging manufacturing capabilities and technology base gaps that are critical to fielding modernization priorities and other US technological advantage areas, including workforce, engineering and prototyping infrastructure and facilities. It also reflects the commitment to balance protection and promotion to advance the emergent technologies and develop a healthy innovation base; including the implementation of a protection strategy that considers critical elements like CFIUS, export controls, and intellectual property. Additional increases support 1) continued assessment and strategy development for the hypersonics industrial base in conjunction with projects in PEs 0605518N (Conventional Prompt Strike (Navy)), 0603680D8Z (Defense Manufacturing Science and Technology Program), 0607210D8Z (Industrial Base Analysis and Sustainment Support), 0603680F (Manufacturing Technology Program (Air Force)), and 0902199D8Z (Title III/Defense Production Act Purchases) to reduce the cost of hypersonics weapons materials and production in ongoing development programs; 2) fund the Biotechnology protection efforts for the Modular Bioindustrial and Reusable (MEMBR) efforts in conjunction with funds in PEs 0603680D8Z (Defense Manufacturing Science and Technology Program), 0605797D8Z (Maintaining Technology Advantage), 0902199D8Z (Title III/Defense Production Act Purchases), and 00602128D8Z (Promotion and Protection Strategies); 3) conduct foundational</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605797D8Z / <i>Maintaining Technology Advantage</i>	Project (Number/Name) 043 / <i>Technology Innovation Base</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
assessments of the Defense Advanced Battery Supply Chain along with funding for DoD battery projects in PEs 0603342D8Z (Defense Innovation Unit (DIU)), 0605798D8Z (Defense Technology Analysis), 0603680D8Z (Defense Wide Manufacturing Science and Technology), 0607210D8Z (Industrial Base Analysis and Sustainment Support), 0603724N (Navy Energy Program), 0603462A (Next Generation Combat Vehicle Advanced Technology, and 0901212N (Service-Wide Support (Not Otherwise Accounted For)). The Biotechnology protection funds (item 2 above) will be transferred to P138 (PE 0605797D8Z) in subsequent revisions to the R-2.			
Accomplishments/Planned Programs Subtotals		3.624	6.930
		FY 2021	FY 2022
Congressional Add: Securing American Science and Technology Program		-	1.000
FY 2022 Plans: This Congressional add will enable expansion of engagements and data-driven analysis to mitigate unwanted technology transfer and foreign influence.			
NOTE: Congressional add will be executed in P138 in FY 2022.			
Congressional Adds Subtotals		-	1.000
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605797D8Z / <i>Maintaining Technology Advantage</i>				Project (Number/Name) 138 / <i>S&T Protection</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
138: <i>S&T Protection</i>	9.230	8.793	6.344	5.740	-	5.740	7.809	7.610	7.285	7.431	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

As the Department develops advanced technologies, it must use a rigorous, repeatable methodology to protect technology advantage beyond current Program Protection Planning policy. The production of Technology Area Protection Plans (TAPPs) will generate consistent and balanced protection of critical technology, provide foundational guidance for communicating about the technology to particular audiences, and inform protection and controls integrated with technology promotion activities. This will encompass the lifecycle of basic and applied research, advanced technology development, prototyping, and technology transition to programs. The Department will establish policy to protect critical technology in science and technology (S&T) investments through program protection. The implementation of these policies and TAPPs will have broad impacts across DoD and interagency-wide activities associated with critical technologies, including export controls, Committee on Foreign Investment in the United States (CFIUS) mitigations, Foreign Investment Risk Review Modernization Act (FIRRMA) decisions, international agreements, counterintelligence and law enforcement priorities, and development of protection practices with DoD research performers (e.g., the DoD and national laboratories, academia, small businesses, and the broader innovation base).

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Science and Technology (S&T) Protection	8.793	6.344	5.740
Description: This project supports efforts to maintain DoD's technology advantage by establishing activities to promote and ensure accountability for mitigating adversary exploitation of technologies critical to national security objectives. This project will develop and oversee S&T policy and practices for informed horizontal protection of emerging and critical technology areas.			
FY 2022 Plans: The program will continue efforts to address S&T protection activities: <ul style="list-style-type: none"> - Oversee S&T protection policy guidance and track implementation. - Develop modules to promote DoD research. - Oversee TAPPs for each modernization initiative/critical technology area. - Deliver/deploy S&T protection curriculum to S&T/Acquisition program and Protection (IC/CI/Security) work force. 			
FY 2023 Plans: <ul style="list-style-type: none"> - Oversee TAPPs for each modernization initiative/critical technology area. - Develop risk review guidelines to mitigate foreign influence in department S&T efforts - Develop data-driven models and analytical assessment capabilities to proactively identify and prioritize protection and exploitation opportunities to maintain the DoD's technology advantage 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605797D8Z / <i>Maintaining Technology Advantage</i>	Project (Number/Name) 138 / <i>S&T Protection</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>- Develop and implement proactive analytic tools supporting the biomanufacturing NSIB to identify strategic competitor programs and entities posing an increased risk of unwanted technology transfer in support of the Modular Bioindustrial and Reusable (MEMBR) efforts. The Biotechnology technology protection funds currently listed in P043 (0605797D8Z) will be transferred to P138 (PE 0605797D8Z) in subsequent revisions to the R-2 to fund these efforts.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> FY 2023 decrease to account for the availability of prior year execution balances.</p>			
Accomplishments/Planned Programs Subtotals		8.793	6.344
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605797D8Z / Maintaining Technology Advantage				Project (Number/Name) 139 / Joint Acquisition Protection Exploitation Cell (JAPEC)			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
139: Joint Acquisition Protection Exploitation Cell (JAPEC)	5.379	6.508	6.512	6.953	-	6.953	7.771	7.666	7.643	7.795	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The DoD established a joint analysis capability (Joint Acquisition Program and Exploitation Cell (JAPEC)) to conduct comprehensive assessments of controlled unclassified technical information losses, and engage acquisition, intelligence, counterintelligence, and law enforcement sources, to determine consequences and appropriate preventative/mitigation actions against unwanted technology transfer. The JAPEC requires the ability to detect and characterize past technology losses, conduct damage assessments of lost information, and provide various insights with predictive value to support and promote activities. Together with supporting organizations, the JAPEC enables comprehensive, detailed assessments of U.S. military technological vulnerability, as well as inform the development and application of effective policies, countermeasures, and enforcement actions to preserve U.S. technical superiority in all warfighting domains. JAPEC must also reach out to select Allies and Partners in order to develop protection efforts across the extended supply chains resulting from the partnerships created by the global S&T community.

JAPEC, and supporting organizations, require an analytic capability to synchronize, integrate, coordinate and inform the DoD efforts in order to protect the acquisition and investment in sensitive U.S. technologies from adversaries and better exploit opportunities to combat adversary activities. JAPEC will conduct trend analysis of protection efforts for the Department's critical acquisition programs and technologies, incorporate findings into protection processes and activities, and analyze losses, to determine consequences and appropriate requirements, acquisition, programmatic, and strategic courses of action to include deterring our strategic competitors and identifying opportunities to promote our innovation base.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Joint Acquisition Protection Exploitation Cell (JAPEC)	6.508	6.512	6.953
Description: Integrate controlled unclassified information, to include Controlled Technical Information (CTI), protection efforts across the DoD to proactively mitigate losses resulting from unwanted technology transfer and exploit opportunities to combat adversaries that may threaten U.S. military advantage.			
FY 2022 Plans: The program will continue efforts to combat strategic competitor technology transfer activities: <ul style="list-style-type: none"> - Continued partnering and development of international (bilateral/multilateral) protection practices with select allies. - Leverage exploitation opportunities to support promote and protect efforts. - Begin development of data informed exploitation opportunities to combat adversaries that may threaten U.S. military advantage. - Begin development of Critical Program and Technology protection performance measures. - Continued development and operationalization of critical program and technology enhanced protection. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605797D8Z / <i>Maintaining Technology Advantage</i>	Project (Number/Name) 139 / <i>Joint Acquisition Protection Exploitation Cell (JAPEC)</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> - Continue to integrate with national CI and LE efforts to combat unwanted strategic competitor activities. <p><i>FY 2023 Plans:</i></p> <ul style="list-style-type: none"> - Continue development and measurement of protection performance measures. - Continue development of data informed exploitation opportunities to combat adversaries that may threaten U.S. military advantage. - Expand partnering and development of international (bilateral/multilateral) protection practices with select allies into multiple DoD modernization areas. - Continued development and operationalization of critical program and technology enhanced protection. - Continue to integrate with national CI and LE efforts to combat unwanted strategic competitor activities. <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> The increase in funding from FY 2022 to FY 2023 reflects the Department need to develop and provide data driven decisions to identify exploitation opportunities.</p>			
Accomplishments/Planned Programs Subtotals		6.508	6.512
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605797D8Z / Maintaining Technology Advantage				Project (Number/Name) 158 / Program and Technology Protection			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
158: Program and Technology Protection	5.635	5.810	6.021	5.461	-	5.461	5.355	5.279	5.077	5.179	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Department of Defense (DoD) must address cybersecurity and supply chain risks to DoD networks, weapons systems, and information stored and processed on both the DoD and the Defense Industrial Base (DIB) unclassified contractor information networks that support DoD programs. Increased reliance on the internet as a vehicle for sharing information, globalization of the supply chain, and advanced persistent threats (APTs) that can evade commercially available security tools and defeat generic security best practices, drives the need for diligent program protection planning and execution. Activities carried out include supporting implementation of DoDI 5000.83, Technology and Program Protection to Maintain Technological Advantage. Program Protection Planning includes protection of classified and unclassified controlled technical information, critical program information, critical components and critical mission functions, and integrates high level security policies and practical expertise to specific acquisition and S&T practices, secure cyber resilient engineering activities, and risk reduction activities. Through this initiative the Department is maturing system security engineering methodologies to protect controlled unclassified information, to include controlled technical information on contractor information networks; improve mitigation and management of information communication technology supply chain risk management risks, improve integration of cybersecurity into the engineering processes through secure cyber resilient engineering methods, improve software assurance practices, mature processes to identify and protect Critical Program Information, mature processes to integrate defense exportability features, and improve program protection planning. Activities carried out, support implementation of DoD Instruction 5200.44 Trusted Systems and Networks with the use of proven mitigation techniques and tools, the ongoing refinement of risk management processes, and creation of needed technology; implementation of DoD Instruction 5200.39 Critical Program Information (CPI) Identification and Protection Within Research, Development, Test, and Evaluation (RDT&E) and DoDD 5200.47 Anti Tamper to identify and protect Critical Program Information; and implementation of DoD Instruction 8582.01 Security of Unclassified DoD Information on Non-DoD Information Systems for Safeguarding Controlled Unclassified Information on contractor owned networks.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Program and Technology Protection	5.810	6.021	5.461
Description: This project provides system security engineering and secure cyber resilient engineering policy, guidance and technical implementation assessments to inform and reduce risks in sharing and storing Controlled Technical Information and data, improve mitigation of supply chain risk management risks, improve integration of cybersecurity into the engineering processes, integrate defense exportability and anti-tamper practices, mature processes to identify Critical Program Information and improve program protection planning. Activities carried out support engineering implementation of DoD instruction 5000.83, Technology and Program Protection to Maintain Technological Advantage; DoD Instruction 5200.44 Trusted Systems and Networks with the use of proven mitigation techniques and tools, the ongoing refinement of risk management processes; implementation of DoD Instruction 5200.39 Critical Program Information (CPI) Identification and Protection Within Research,			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605797D8Z / <i>Maintaining Technology Advantage</i>	Project (Number/Name) 158 / <i>Program and Technology Protection</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>Development, Test, and Evaluation (RDT&E) and DoDD 5200.47E Anti Tamper to identify and protect Critical Program Information; and implementation of DoD Instruction 8582.01 Security of Unclassified DoD Information on Non-DoD Information Systems for Safeguarding Controlled Unclassified Information on contractor owned networks.</p> <p>FY 2022 Plans: Continue to:</p> <p>Provide support to Independent Technical Review Assessment and Cyber Vulnerability Review Assessment teams in conduct of broad program protection planning activities to assess:</p> <ul style="list-style-type: none"> - Conduct of criticality analyses to determine supply chain risk management protections. - Conduct of Critical Program Information analysis to determine anti-tamper protections. - Conduct of secure cyber resilient engineering activities to determine technical cyber risks. - Conduct of Program Protection planning activities, and track progress to protections of capability, systems and technologies. <p>Advance the state of the practice of systems security engineering and secure cyber resilient engineering:</p> <ul style="list-style-type: none"> - Continue development of methodologies to identify and mitigate system security risk, to include cybersecurity and supply chain risk. - Initiate activities to support EO 14028, Improving the Nation's Cybersecurity. - Continue to develop courseware, refine guidance, provide training, and outreach with government and industry. - Continue to refine guidance, tools and mitigation approaches to mitigate capability, system and technology risks. <p>Safeguard Controlled Unclassified Information, including Controlled Technical Information:</p> <ul style="list-style-type: none"> - Continue to refine implementation and guidance of marking and dissemination of distribution of technical information. - continue to refine safeguarding information protection methods for contractor unclassified information networks. <p>Safeguard Critical Program Information:</p> <ul style="list-style-type: none"> - Continue to refine implementation, guidance and tools to identify Critical Program Information. - Continue to refine Anti-Tamper protections methods to safeguard Critical Program Information. <p>Defense exportability features integration:</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605797D8Z / <i>Maintaining Technology Advantage</i>	Project (Number/Name) 158 / <i>Program and Technology Protection</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> - Continue to mature processes, methods and guidance for defense exportability features integration. - Continue to develop and refine defense exportability protection methods to improve planning for the exportability of U.S. Defense systems. <p>FY 2023 Plans: Continue to:</p> <p>Provide support to Independent Technical Review Assessment and Cyber Vulnerability Review Assessment teams in conduct of broad program protection planning activities to assess:</p> <ul style="list-style-type: none"> - Conduct of criticality analyses to determine supply chain risk management protections. - Conduct of Critical Program Information analysis to determine anti-tamper protections. - Conduct of secure cyber resilient engineering activities to determine technical cyber risks. <p>Advance the state of the practice of systems security engineering and secure cyber resilient engineering:</p> <ul style="list-style-type: none"> - Continue activities to support EO 14028, Improving the Nation's Cybersecurity. - Continue development of methodologies to identify and mitigate system security risk, to include cybersecurity and supply chain risk. - Continue to develop courseware, refine guidance, provide training, and outreach with government and industry. - Continue to refine guidance, tools and mitigation approaches to mitigate capability, system and technology risks. <p>Safeguard Controlled Unclassified Information, including Controlled Technical Information:</p> <ul style="list-style-type: none"> - Continue to refine implementation and guidance of marking and dissemination of distribution of technical information. - continue to refine safeguarding information protection methods for contractor unclassified information networks. <p>Safeguard Critical Program Information:</p> <ul style="list-style-type: none"> - Continue to refine implementation, guidance and tools to identify Critical Program Information. - Continue to refine Anti-Tamper protections methods to safeguard Critical Program Information. <p>Defense exportability features integration:</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605797D8Z / <i>Maintaining Technology Advantage</i>	Project (Number/Name) 158 / <i>Program and Technology Protection</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> - Continue to mature processes, methods and guidance for defense exportability features integration. - Continue to develop and refine defense exportability protection methods to improve planning for the exportability of U.S. Defense systems. <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> FY 2023 decrease to account for the availability of prior year execution balances.</p>			
Accomplishments/Planned Programs Subtotals		5.810	6.021
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support</i>	PE 0605798D8Z / <i>Defense Technology Analysis</i>											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	22.544	35.149	56.114	0.000	56.114	58.396	58.264	59.276	60.461	Continuing	Continuing
796: <i>Laboratory Resource Management</i>	-	7.957	15.892	31.332	0.000	31.332	34.362	34.370	34.886	35.584	Continuing	Continuing
797: <i>Defense Technology Analysis</i>	-	3.211	8.487	11.648	0.000	11.648	11.714	11.701	11.944	12.182	Continuing	Continuing
798: <i>Defense Support Teams</i>	-	9.338	8.339	8.816	0.000	8.816	9.071	9.297	9.490	9.680	Continuing	Continuing
728: <i>Homeland Defense Capability Development</i>	-	2.038	2.431	4.318	0.000	4.318	3.249	2.896	2.956	3.015	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Departments initiatives to Build a Sustainable and Long-Term Advantage, and Build a Resilient Joint Force and Defense Ecosystem.

The Under Secretary of Defense for Research and Engineering (USD(R&E)) is the principal staff advisor to the Secretary and Deputy Secretary of Defense, responsible for the research, development, and prototyping activities across the Department of Defense (DoD) enterprise. In this capacity, the USD(R&E) conducts analyses and studies; develops policies; provides technical leadership, oversight and advice; and issues guidance for the Department of Defense (DoD) Research, Development, Test and Evaluation (RDT&E) programs. This program element (PE) provides mission support to the USD(R&E) covering a wide range of studies and analysis in support of the R&E program and its impacts to the Department's decision to fund RDT&E efforts. Such activities include: (1) identification and development of new technological opportunities; (2) insertion of new technologies into warfighting systems and operations; and (3) management and evaluation of the effectiveness of technology programs.

This program provides funding for the Defense Laboratory Office within the USD(R&E). The Defense Laboratory Office mission is to craft policy and provide the oversight necessary to both preserve current, and develop future, DoD in-house laboratory capability such that they continue to generate mission-critical innovations that increase the U.S. military advantage and enhance U.S. national security. The Defense Laboratory Office advocates and supports the DoD laboratory system in three areas: (1) facilities and infrastructure; (2) personnel and quality of workforce; and (3) technology transfer.

The program provides funding for engineering, scientific, and analytical support to the USD(R&E) in its responsibility for direction, overall quality, and content of the science and technology (S&T) program and to ensure that the technology being developed is affordable and helps minimize system development risk.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I</i> BA 6: <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605798D8Z / <i>Defense Technology Analysis</i>
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These funds research and technical analysis and management, under the direction of the Director of Defense Research and Engineering for Modernization (DDRE(M)). These investments will promote further prioritization and targeting of the Department's key investments across the modernization efforts.

Additionally, this program funds Homeland Defense Capabilities Development Initiatives to address technology application in support of homeland defense of our military installations and the surrounding areas.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	23.341	39.774	0.000	0.000	0.000
Current President's Budget	22.544	35.149	56.114	0.000	56.114
Total Adjustments	-0.797	-4.625	56.114	0.000	56.114
• Congressional General Reductions	-	-7.500			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	3.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.793	-			
• Other Reprogramming	-0.004	-	-	-	-
• FFRDC	-	-0.125	-	-	-
• Adjustments to Budget Year	-	-	53.309	-	53.309
• Economic Assumption	-	-	1.905	-	1.905
• Defense Advanced Battery Supply Chain	-	-	0.900	-	0.900

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 796: *Laboratory Resource Management*

 Congressional Add: *Program Increase - Defense Technology Transfer*

	FY 2021	FY 2022
Congressional Add Subtotals for Project: 796	3.000	3.000
Congressional Add Totals for all Projects	3.000	3.000

Change Summary Explanation

In FY 2022 congressional funding reduction of -\$7.500 million due to excess growth.

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605798D8Z / Defense Technology Analysis				Project (Number/Name) 796 / Laboratory Resource Management			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
796: Laboratory Resource Management	-	7.957	15.892	31.332	0.000	31.332	34.362	34.370	34.886	35.584	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Laboratories & Personnel Office (L&PO) provides advocacy, strategic planning, and policy for the DoD's laboratories. The DoD Laboratory Enterprise consists of more than 60 laboratories with approximately 67,000 employees (approximately 50,000 of whom are scientists and engineers). L&PO develops proposals and investment strategies for laboratory infrastructure, technology transfer programs, and personnel development. Section 211 of the National Defense Authorization Act (NDAA) for FY 2017 also transferred the management of the laboratory demonstration program at Science and Technology Reinvention Laboratories (STRs) from the Under Secretary of Defense for Personnel and Readiness (USD(P&R)) to the Under Secretary of Defense for Research and Engineering (USD(R&E)). Section 218 of the NDAA for FY 2018 amended the authority by re-designating management to the USD(R&E).

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Laboratories and Personnel Office	4.957	3.192	6.332
Description: Provides advocacy, strategic planning, and policy for the DoD's laboratories. Develops proposals and investment strategies for laboratory infrastructure, technology transfer programs, and personnel development.			
FY 2022 Plans: <ul style="list-style-type: none"> Continue to develop plans, policies, and investment strategies for laboratory infrastructure, technology transfer programs, personnel development, and Laboratory Quality Enhancement Program Panels that support the Defense Laboratory Enterprise. From the completed Partnership Intermediary Agreement study, identify best practices and value/impact to laboratory and/or Service mission, and understand the various business models implemented across the DoD technology transfer community. 			
FY 2023 Plans: <ul style="list-style-type: none"> Propose and evaluate best practices for planning, programming, and executing infrastructure construction projects at DoD Science and Technology Reinvention Laboratories (STRs) and support methodologies for assessing their readiness to achieve their missions. 			
FY 2022 to FY 2023 Increase/Decrease Statement: <p>Increase in funding to support additional pilot programs and development of case studies/training material to support the DoD's laboratories in enhancing their technology transfer and public/private partnership efforts.</p>			
Title: Central Lab Investment Program (CLIP)	-	9.700	25.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 6		R-1 Program Element (Number/Name) PE 0605798D8Z / Defense Technology Analysis		Project (Number/Name) 796 / Laboratory Resource Management	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>Description: This effort seeks to address infrastructure gaps within the Department's Laboratory community by establishing a dedicated funding stream for the DoD's laboratories to address infrastructure issues, including facility planning, design, construction, sustainment repair, and/or modernization. In addition, CLIP could be used to acquire advanced equipment and tools, enabling the laboratories to devote their RDT&E funding to critical research and development and offset their sustainment, repair, and modernization (SRM) funding gap.</p> <p>FY 2022 Plans: Establish and execute policy and a program to solicit and select laboratory infrastructure and equipment projects executable within one year of award.</p> <p>FY 2023 Plans: Select and award laboratory infrastructure and equipment projects received under a FY 2022 call for proposals. Continue strategic plans and projects that meet the program's objectives to comprehensively address infrastructure issues.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The DoD Laboratories have annually presented an unfunded military construction request to Congress; this fund will begin to address the challenges that the Service laboratories face in their attempts to fund laboratory and equipment capability improvements through a comprehensive strategic plan. The increase in funding will support additional laboratory and infrastructure projects selected through a FY 2022 call for proposals.</p>					
Accomplishments/Planned Programs Subtotals			4.957	12.892	31.332
			FY 2021	FY 2022	
Congressional Add: Program Increase - Defense Technology Transfer			3.000	3.000	
<p>FY 2021 Accomplishments: Funding was sent to the Air Force Research Laboratory to support the MilTech technology transition program, which will:</p> <ul style="list-style-type: none"> - Provide technology transition expert support to the DoD laboratories and programs; - Develop and provide technology transition training to the DoD technology transfer professionals; and - Identify and share best practices of the DoD technology transition activities and programs. <p>FY 2022 Plans: Continue to build on FY 2021 progress through a Partnership Intermediary Agreement (PIA) with MilTech.</p>					
Congressional Adds Subtotals			3.000	3.000	

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605798D8Z / <i>Defense Technology Analysis</i>	Project (Number/Name) 796 / <i>Laboratory Resource Management</i>
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605798D8Z / Defense Technology Analysis				Project (Number/Name) 797 / Defense Technology Analysis			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
797: Defense Technology Analysis	-	3.211	8.487	11.648	0.000	11.648	11.714	11.701	11.944	12.182	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Defense Technology Analysis (DTA) project funds engineering, scientific, and analytical support for the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) and specifically the office of the Director of Defense Research and Engineering for Modernization (DDRE(M)) starting in FY 2021. The DDRE(M) supports the USD(R&E) by prioritizing the National Defense Strategy modernization lines of effort in order to maintain competitive advantage against adversaries. The efforts funded in this project directly support and are critical to developing and continuously updating research and technology development roadmaps as required by Section 217 of the National Defense Authorization Act for FY 2021 .

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Defense Technology Analysis	3.211	8.487	11.648
Description: The DDRE(M) is responsible for developing the Department's roadmap efforts in the eleven modernization priorities areas: 5G; Artificial Intelligence; Autonomy; Biotechnology; Cyber; Directed Energy; Fully Networked Command, Control, and Communication; Hypersonics; Microelectronics; Quantum Science; and Space. Identification of leading edge technology is critical in delivering capability to the warfighter and maintaining the competitive advantage. Funding for research, technical analysis and management, and other advanced research methods will allow for success in identifying game changing technology investments for the Department's modernization efforts.			
FY 2022 Plans: Leverage strategic partnerships to ensure the Department's investments are appropriately focused on the modernization priorities and address issues to close remaining investment gaps. Continue to conduct analysis and research studies to support updates and advancements of modernization roadmaps to reflect emerging trends and ensuring the Department's competitiveness.			
FY 2023 Plans: Adversary and competitor actions seek to disrupt and diminish the United States' advantages. Advancement of research and development in the eleven modernization priorities will enhance the United States' competitive advantage. The Department will continue to conduct analysis and research studies to support updates to and advancements of modernization roadmaps synchronized with related priorities. Focus areas include the emerging technology industrial base and the workforce, including universities. The studies and analyses conducted will focus not only on closing gaps and identifying overlap, but providing leap-ahead capabilities.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605798D8Z / <i>Defense Technology Analysis</i>	Project (Number/Name) 797 / <i>Defense Technology Analysis</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
Increased emphasis and need for promoting the Department's key priorities across the modernization efforts with increased investment in engineering, scientific, analytical, and managerial support to and studies for the OUSD(R&E).			
Accomplishments/Planned Programs Subtotals		3.211	8.487
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605798D8Z / Defense Technology Ana lysis				Project (Number/Name) 798 / Defense Support Teams			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
798: Defense Support Teams	-	9.338	8.339	8.816	0.000	8.816	9.071	9.297	9.490	9.680	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Department's key expertise for reviewing and guiding research and engineering (R&E) programs resides in the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)). The OUSD(R&E) staff augment their responsibilities through connections to technology experts in various fields throughout academia, industry, and government.

This project provides engineering, scientific, and analytical support to the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) in its responsibility for direction, overall quality, and content of the science and technology (S&T) program. This activity conducts assessments and analyses to ensure maximum utilization of research and development funds to accomplish the overall objectives of the S&T program. It ensures the technology being developed is affordable and minimizes system development risk. Funds are required for technical, analytical, management support, travel, and publications.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Defense Support Teams	9.338	8.339	8.816
Description: This project provides engineering, scientific, and analytical support to the OUSD(R&E) in its responsibility for direction, overall quality, and content of the S&T program. Furthermore, it ensures that the technology being developed is affordable and minimizes system development risk.			
FY 2022 Plans: Continue to provide engineering, scientific, analytical, and managerial support to the OUSD(R&E) in developing strategies, plans, and policies to develop and exploit technology; conduct technology analyses, make recommendations, and develop guidance for S&T plans and programs; review acquisition programs and make recommendations to optimize effectiveness of the DoD investments; and oversight of S&T issues and initiatives and respond to Congressional special interests.			
FY 2023 Plans: Continue to provide engineering, scientific, analytical, and managerial support to the OUSD(R&E) in developing strategies, plans, and policies to develop and exploit technology; conduct technology analyses, make recommendations, and develop guidance for S&T plans and programs; review acquisition programs and make recommendations to optimize effectiveness of the DoD investments; and oversight of S&T issues and initiatives and respond to Congressional special interests.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605798D8Z / Defense Technology Analysis	Project (Number/Name) 798 / Defense Support Teams

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
There is no significant change between FY 2022 and FY 2023.			
Accomplishments/Planned Programs Subtotals	9.338	8.339	8.816

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605798D8Z / Defense Technology Analysis				Project (Number/Name) 728 / Homeland Defense Capability Development			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
728: Homeland Defense Capability Development	-	2.038	2.431	4.318	0.000	4.318	3.249	2.896	2.956	3.015	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In order to better align and support the Joint Warfighting Concept, the Homeland Defense Capability Development initiative is focused on small unmanned and counter small unmanned systems science and technology (S&T) innovation.

A. Mission Description and Budget Item Justification

The Homeland Defense Capability Development Initiatives project uniquely engages with the Services, Combatant Commands, and our federal partners on critical S&T initiatives to both develop emerging unmanned systems technology and countering small unmanned system threats to our military forces and installations across all domains. Work in this project explores and identifies critical technology needs across the domains of Air, Land, Sea and Space, and enables development of synergistic platforms and weapons systems S&T strategies to include unmanned and counter small unmanned systems technologies, directed energy, munitions, power and energy, and their applications to future force projection and protection capabilities as identified in the National Defense Strategy.

Key technology applications complement the Office of the Under Secretary of Defense for Research and Engineering's modernization priorities: Fully Networked Command, Control, and Communications; Directed Energy; Cyber; Autonomy; and Machine Learning/Artificial Intelligence.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Homeland Defense Capability Development Initiatives	2.038	2.431	3.418
FY 2022 Plans: Continue to provide S&T and RDT&E support from FY 2020 Cruise Missile Defense (CMD)/Homeland Defense Design, Humanitarian Assistance/Disaster Relief (HADR) Enabling Commercial Technologies, and Sustainable Microgrid Technologies to Defend Key Locations/Assets against Powergrid Attacks efforts. Continue to support analysis to include the discrimination of 5G-enabled autonomous threats, interagency Unmanned Aircraft Systems (UAS) technology projects, defense against autonomous systems, and defense against projected homeland air threats, supporting NDS global trends on technology. Conduct strategic studies, analyses, and modeling to identify critical technologies required to enable advanced force projection and protection capabilities, such as the ability to mitigate adversarial large-scale collaborative engagement and swarming of munitions and unmanned systems.			
FY 2023 Plans: Complete analyses of 5G-enabled autonomous threats, exploring ways in which the 5G communication and control links associated with a sUAS platform can be used for detection and discrimination from non-sUAS 5G users. Evaluate Group 3			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605798D8Z / <i>Defense Technology Analysis</i>	Project (Number/Name) 728 / <i>Homeland Defense Capability Development</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>Unmanned Aircraft System impacts on integrated air defense capabilities in the NORAD and USNORTHCOM or INDOPACOM areas of regard, describe limitations of current technology, as well as identify opportunities for new technologies to improve integrated air defense capabilities against emerging Group 3 UAS threats. Further strategic studies, analyses and modeling to identify critical technologies required to enable advanced force projection and protection capabilities and mitigate adversarial large-scale collaborative engagement and swarming of munitions and unmanned systems. Assess and identify critical unmanned systems technologies and novel use of cross domain unmanned systems across force protection applications.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> Increase in funding required to explore cross domain applications of unmanned systems for force protection applications.</p>			
<p><i>Title:</i> Defense Advanced Battery Supply Chain</p> <p><i>FY 2023 Plans:</i> In coordination with Army, Navy, and USD(A&S), generate analytics that characterize the Department's current and projected energy/advanced battery needs. Develop and implement the methodology to effectively measure and track vulnerabilities in the battery supply chain across the Services.</p> <p>Funding provided in PEs 0603342D8Z, 0605798D8Z, 0603680D8Z, 0607210D8Z, 0605805Z, 0603724N, 0603462A, and 0901212N.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> FY 2023 enhancement to support the Defense Advanced Battery Supply Chain consistent with DoD priorities.</p>		-	-
			0.900
Accomplishments/Planned Programs Subtotals		2.038	2.431
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 6:</i> <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605804D8Z / <i>Development Test & Evaluation</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	139.751	26.240	27.280	26.652	0.000	26.652	27.264	27.707	28.290	28.855	Continuing	Continuing
804: <i>Development Test & Evaluation</i>	139.751	19.485	20.391	19.431	0.000	19.431	20.029	20.470	20.900	21.318	Continuing	Continuing
048: <i>Cybersecurity DT&E for Weapon Systems</i>	0.000	6.755	6.889	7.221	0.000	7.221	7.235	7.237	7.390	7.537	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Build Sustainable and Long-Term Advantage, and Build a Resilient Joint Force and Defense Ecosystem.

Program Element (PE) 0605804D8Z establishes the dedicated funding line to carry out the duties in accordance with Title 10 U.S.C. Section 133a, National Defense Authorization Act (NDAA) for 2018 section 838, and the Department of Defense (DoD) Directive 5137.02 dated July 15, 2020. In FY 2020, Under Secretary of Defense for Research and Engineering (USD, R&E) established the office of the Director, Developmental Test, Evaluation, and Assessments (DTE&A) to provide consolidated Developmental Test and Evaluation (DT&E) and Independent Technical Assessment functions in a single office. The Director, DTE&A, is the principal advisor to the Secretary of Defense; (OUSD(R&E)); and the Under Secretary of Defense, Acquisition and Sustainment (USD(A&S)) on DT&E and Technical Risk Assessments in the Department of Defense (DoD).

The OUSD(R&E) engages with acquisition and rapid prototype programs to provide test planning expertise, including cybersecurity DT&E, and decision-quality data at major program reviews to help them succeed in modernizing key capabilities to Build a More Lethal Force. OUSD(R&E) ensures programs meet interoperability requirements to deepen interoperability and Strengthen Alliances. Finally, OUSD(R&E) works with Director, Operational Test and Evaluation to streamline T&E policy and guidance to improve test efficiency, and reduce acquisition cost and schedule to Reform the Department for Greater Performance and Affordability.

Program Element (PE) 0605804D8Z supports and improves the DT&E efforts of Major Defense Acquisition Program (MDAP), Rapid Prototyping/Fielding efforts, and other Special Interest (SI) acquisition programs designated by USD(R&E) or USD(A&S) as they progress through the acquisition/development lifecycle; supports development of the defense acquisition workforce Test and Evaluation (T&E) career field; and supports development of policy and guidance for the conduct of DT&E within the DoD. This PE also provides dedicated resources to support MDAP and Rapid Prototyping/Fielding Program Managers, Chief Developmental Testers, and Lead DT&E Organizations in the development of comprehensive, efficient, and innovative Cybersecurity DT&E strategies/plans to support key acquisition milestones and engineering/programmatic decisions.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 6:</i> <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605804D8Z / <i>Development Test & Evaluation</i>
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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	27.198	27.366	0.000	0.000	0.000
Current President's Budget	26.240	27.280	26.652	0.000	26.652
Total Adjustments	-0.958	-0.086	26.652	0.000	26.652
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.953	-			
• Adjustments to Budget Year	-	-	25.734	0.000	25.734
• Other Program Adjustments	-0.005	-	0.000	0.000	0.000
• Program Adjustments	-	-	0.918	0.000	0.918
• FFRDC Reduction	-	-0.086	-	-	-

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605804D8Z / Development Test & Evaluation				Project (Number/Name) 804 / Development Test & Evaluation			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
804: Development Test & Evaluation	139.751	19.485	20.391	19.431	0.000	19.431	20.029	20.470	20.900	21.318	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 804 provides resources to support MDAP and Rapid Prototyping/Fielding Program Managers, Chief Developmental Testers, and Lead DT&E Organizations in the development of comprehensive, efficient, and innovative DT&E strategies to support key acquisition milestones and engineering decisions. This project also supports the OUSD(R&E) to manage the Test & Evaluation (T&E) career field and curriculum for the DoD acquisition workforce, and develop policy and guidance for the conduct of DT&E within DoD. On behalf of the OUSD(R&E) this project executes the following activities:

- Support acquisition programs in the development of comprehensive, efficient, and innovative test strategies. Ensure that developmental test strategies are documented in Test and Evaluation Master Plans (TEMPs). For ACAT ID programs, review and approve/disapprove the DT&E strategy within the TEMP. For ACAT IB/IC programs, review the DT&E strategy within the TEMP and provide a recommendation to the Service Milestone Decision Authority as to whether or not the strategy is adequate.
- Support rapid prototyping, rapid fielding, and technology demonstrations efforts in the development of tailored comprehensive, efficient, and innovative DT&E strategies.
- For ACAT ID programs, provide independent DT&E Sufficiency Assessments prior to Milestone B and C decisions with the goal of reducing discovery of performance issues later in the acquisition cycle.
- When requested by the Secretary or Deputy Secretary of Defense, provide independent developmental test assessments in support of USD(A&S) and Service Major Defense Acquisition Programs.
- Support the development of independent technical risk assessments and advise the Secretary on the progress toward meeting Key Performance Parameters, technology maturation, reliability growth projections, interoperability, and cybersecurity posture before any decision to grant Milestone A or B approval, or enter into low-rate initial production or full-rate production for ACAT ID programs or when requested by the Secretary.
- Manage the Scientific Test and Analysis Techniques Center of Excellence (STAT COE).
- Identify the DoD test infrastructure gaps and support development of the OUSD(R&E) test resources strategic plan.
- Evolve the DT&E 'state of practice' to keep pace with emerging technologies and improve test efficiency to field systems faster.
- Coordinate with Director, Operational Test and Evaluation to improve T&E efficiency and make best use of integrated testing.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Development Test and Evaluation	19.485	20.391	19.431	0.000	19.431

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022		
Appropriation/Budget Activity 0400 / 6		R-1 Program Element (Number/Name) PE 0605804D8Z / Development Test & Evaluation		Project (Number/Name) 804 / Development Test & Evaluation		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>Description: This program supports and improves the DT&E efforts of Major Defense Acquisition Program (MDAP), Rapid Prototyping efforts, and other Special Interest (SI) acquisition programs as they progress through the acquisition lifecycle; lead the defense acquisition workforce T&E career field; and support development of policy and guidance for the conduct of DT&E within the DoD.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none">- Work with Acquisition Program Managers, Chief Developmental Testers, and Lead DT&E organizations to improve DT&E planning and develop comprehensive and efficient DT&E strategies/plans through the use of disciplined Developmental Evaluation Framework Matrices and Scientific Test and Analysis Techniques (STAT).- Continue to support rapid prototyping, rapid fielding, and technology demonstrations efforts in the development of tailored comprehensive, efficient, and innovative DT&E strategies/plans.- Continue to implement the OUSD(R&E) 'Shift Left' initiative that focuses on ensuring DT&E strategies are developed in advance of releasing Technology Maturation and Risk Reduction (TMRR) and Engineering and Manufacturing Development (EMD) RFPs, and increasing the amount and quality of data available to support production decisions with specific focus on cybersecurity, interoperability, and reliability.- For ACAT ID programs, review/approve all TEMPs submitted to support milestone reviews. Ensure DT&E planning is complete prior to the start of DT&E activities. For ACAT IB/IC programs, review the DT&E strategy within the TEMP and provide a recommendation to the Service Milestone Decision Authority as to whether or not the strategy is adequate.- For ACAT ID programs, publish independent DT&E Sufficiency Assessments prior to Milestone B and C decisions with the goal of reducing discovery of performance issues later in the acquisition cycle.- When requested by the Secretary or Deputy Secretary of Defense, provide independent developmental test assessments in support of USD(A&S) and Service Major Defense Acquisition Programs.- Refine DT&E policies and methodologies addressing DT&E across all Acquisition programs.- Promote the application of sound DT&E and related technical disciplines across the Department's acquisition community and programs.- Implement initiatives that evolve the DT&E 'state of practice' to keep pace with emerging technologies and improve test efficiency to field systems faster. <p>FY 2023 Base Plans:</p> <ul style="list-style-type: none">- Work with Acquisition Program Managers, Chief Developmental Testers, and Lead DT&E organizations to improve DT&E planning and develop comprehensive and efficient DT&E strategies through the use of disciplined Developmental Evaluation Framework Matrices and Scientific Test and Analysis Techniques (STAT).						

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022		
Appropriation/Budget Activity 0400 / 6		R-1 Program Element (Number/Name) PE 0605804D8Z / <i>Development Test & Evaluation</i>		Project (Number/Name) 804 / <i>Development Test & Evaluation</i>		
B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<ul style="list-style-type: none"> - Continue to support rapid prototyping, rapid fielding, and technology demonstrations efforts in the development of tailored comprehensive, efficient, and innovative DT&E strategies. - Continue to implement the OUSD(R&E) 'Shift Left' initiative that focuses on ensuring DT&E strategies are developed in advance of releasing Technology Maturation and Risk Reduction (TMRR) and Engineering and Manufacturing Development (EMD) RFPs, and increasing the amount and quality of data available to support production decisions with specific focus on cybersecurity, interoperability, and reliability. - For ACAT ID programs, review/approve all TEMPs submitted to support milestone reviews. Ensure DT&E planning is complete prior to the start of DT&E activities. For ACAT IB/IC programs, review the DT&E strategy within the TEMP and provide a recommendation to the Service Milestone Decision Authority as to whether or not the strategy is adequate. - For ACAT ID programs, publish independent DT&E Sufficiency Assessments prior to Milestone B and C decisions with the goal of reducing discovery of performance issues later in the acquisition cycle. - When requested by the Secretary or Deputy Secretary of Defense, provide independent developmental test assessments in support of USD(A&S) and Service Major Defense Acquisition Programs. - Refine DT&E policies and methodologies addressing DT&E across all Acquisition programs. - Promote the application of sound DT&E and related technical disciplines across the Department's acquisition community and programs. - Implement initiatives that evolve the DT&E 'state of practice' to keep pace with emerging technologies and improve test efficiency to field systems faster. <p>FY 2023 OCO Plans: N/A.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Changes reflect the conclusion of a three year funding increase across FY 2020 through FY 2022 to provide additional funding for efforts at the Statistical Test and Analysis Techniques Center of Excellence.</p>						
Accomplishments/Planned Programs Subtotals		19.485	20.391	19.431	0.000	19.431
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
N/A						

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605804D8Z / <i>Development Test & Evaluation</i>	Project (Number/Name) 804 / <i>Development Test & Evaluation</i>
D. Acquisition Strategy N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605804D8Z / Development Test & Evaluation				Project (Number/Name) 048 / Cybersecurity DT&E for Weapon Systems			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
048: Cybersecurity DT&E for Weapon Systems	0.000	6.755	6.889	7.221	0.000	7.221	7.235	7.237	7.390	7.537	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project provides dedicated resources to support MDAP and Rapid Prototyping Program Managers, Chief Developmental Testers, and Lead DT&E Organizations in the development of comprehensive, efficient, and innovative Cybersecurity DT&E strategies to support key acquisition milestones and engineering/programmatic decisions. On behalf of the OUSD(R&E) this project executes the following activities:

- Support acquisition programs in the development of comprehensive, efficient, and innovative Cybersecurity DT&E strategies. Ensure that Cybersecurity DT&E strategies are documented in Test and Evaluation Master Plans (TEMPs). For ACAT ID programs, review and approve/disapprove the Cybersecurity DT&E strategy/plans within the TEMP.
- Support rapid prototyping, rapid fielding, and technology demonstrations efforts in the development of tailored comprehensive, efficient, and innovative Cybersecurity DT&E strategies/plans.
- Support the development of independent technical risk assessments and advise the Secretary on the Cybersecurity, cyber survivability, and resilience posture before any decision to grant Milestone A or B approval, or enter into low-rate initial production or full-rate production for ACAT ID programs or when requested by the Secretary.
- Identify DoD Cybersecurity test infrastructure gaps and support development of the OUSD(R&E) test resources strategic plan.
- Evolve the Cybersecurity DT&E 'state of practice' to keep pace with emerging technologies and improve test efficiency to field systems faster.
- Coordinate with Director, Operational Test and Evaluation to improve Cybersecurity T&E efficiency and make best use of integrated testing.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Cybersecurity DT&E for Weapon Systems	6.755	6.889	7.221	0.000	7.221
Description: This program supports and improves the Cybersecurity DT&E efforts of Major Defense Acquisition Program (MDAP), Rapid Prototyping/Fielding efforts, and other Special Interest (SI) acquisition programs as they progress through the acquisition/development lifecycle; and support development of policy and guidance for the conduct of Cybersecurity DT&E within the DoD.					
FY 2022 Plans: - Work with Acquisition Program Managers, Chief Developmental Testers, and Lead DT&E organizations to improve Cybersecurity DT&E planning and develop comprehensive and efficient DT&E strategies/plans through the use of disciplined Developmental Evaluation Framework Matrices and Scientific Test and Analysis					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022		
Appropriation/Budget Activity 0400 / 6		R-1 Program Element (Number/Name) PE 0605804D8Z / Development Test & Evaluation		Project (Number/Name) 048 / Cybersecurity DT&E for Weapon Systems		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Techniques (STAT). Help programs develop Cybersecurity T&E objectives that align cybersecurity requirements for security standards, cyber survivability, and operational resilience. - Support rapid prototyping, rapid fielding, and technology demonstrations efforts in the development of tailored comprehensive, efficient, and innovative Cybersecurity DT&E strategies/plans. - Implement the OUSD(R&E) 'Shift Left' initiative that focuses on ensuring Cybersecurity DT&E strategies/plans are developed in advance of releasing Technology Maturation and Risk Reduction (TMRR) and Engineering and Manufacturing Development (EMD) RFPs, and increasing the amount and quality of data available to support production decisions. - Refine Cybersecurity DT&E policies and methodologies addressing Cybersecurity DT&E across all Acquisition programs. - When requested by the Secretary or Deputy Secretary of Defense, provide independent Cybersecurity developmental test assessments in support of USD(A&S) and Service Major Defense Acquisition Programs. - Provide Cybersecurity DT&E subject matter experts to assist programs in building Developmental Evaluation Frameworks (DEFs), conducting Cybersecurity Table Top Exercises to identify potential threat vectors, and assist programs with exercising Phases 1 and 2 of the DoD Cybersecurity T&E Process. - Promote the application of sound Cybersecurity DT&E and related technical disciplines across the Department's acquisition community and programs. - Implement initiatives that evolve the Cybersecurity DT&E 'state of practice' to keep pace with emerging technologies and improve test efficiency to field systems faster. - Implement initiatives to guide acquisition programs for how to use Cybersecurity T&E planning and analysis and Cybersecurity tests to identify and mitigate cyber risk in supply chains, development environments, tools and processes. - Collaborate with the Intelligence communities to improve cyber intelligence support to Cybersecurity DT&E. - Work with Lead DT&E organizations to improve Cybersecurity DT&E workforce capability and retention as well as capacity to support earlier integrated contractor and government Cybersecurity DT&E. FY 2023 Base Plans: - Work with Acquisition Program Managers, Chief Developmental Testers, and Lead DT&E organizations to improve Cybersecurity DT&E planning and develop comprehensive and efficient DT&E strategies/plans through the use of disciplined Developmental Evaluation Framework Matrices and Scientific Test and Analysis Techniques (STAT). Help programs develop Cybersecurity T&E objectives that align cybersecurity requirements for security standards, cyber survivability, and operational resilience.						

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605804D8Z / <i>Development Test & Evaluation</i>	Project (Number/Name) 048 / <i>Cybersecurity DT&E for Weapon Systems</i>
C. Other Program Funding Summary (\$ in Millions)		
<u>Remarks</u>		
<u>D. Acquisition Strategy</u> N/A.		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0606100D8Z / <i>Budget and Program Assessments</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	48.548	10.729	13.994	15.244	-	15.244	13.251	13.131	13.385	13.654	-	-
101: <i>Budget and Program Assessments</i>	44.548	5.992	7.528	8.596	-	8.596	8.821	8.935	9.100	9.283	-	-
118: <i>Enterprise VAMOSC</i>	4.000	4.737	6.466	6.648	-	6.648	4.430	4.196	4.285	4.371	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression, Defend the Homeland, and Build Sustainable and Long-Term Advantage.

This program supports the Office of the Director, Cost Assessment & Program Evaluation (CAPE) by funding assessments that help to resolve budget and programmatic issues across the full range of the Department's activities. Projects that support this effort help to inform leadership on program alternatives, capability concept development, design and cost, as well as the appropriate balance of capabilities across the force. They also help to identify how well the Department is meeting its expenditure goals, and how well the force can implement the National Defense Strategy. These RDT&E resources support critical studies and analyses to assist senior DoD leaders in optimally balancing the lethality, partnership, and reform levels of effort to carry out the National Defense Strategy.

This program provides for analytical research across the entire spectrum of defense issues and concerns. The research agenda focuses on near to long-term problems identified by the Secretary of Defense, addressing difficult and complex questions linked to program alternatives for current and future capabilities and forces in order to enhance senior leadership's deliberations and decision-making.

This program provides the scientific and technical engineering services needed for research studies in the development of models and simulations and the evaluation of current analytical tools and scientific methods used to evaluate and assess weapons systems and warfighting capabilities for warfighting environments and scenarios, and related force structure. Deliverables from this program will include reports, briefings, and analyses designed to illuminate critical issues facing the Department. Outcomes include recommendations for new modeling techniques, programmatic alternatives, and scenario development.

The FY 2023 budget proposal continues resources to support the Enterprise Visibility and Maintainability of Operation and Support Costs (EVAMOSC). EVAMOSC supports CAPE's responsibility to develop and maintain a database of actual operating and support (O&S) costs for major weapons systems, as required in 10 USC Ch. 137, Sec. 2337a and further refined by Sec. 832 of the 2019 NDAA. Additionally, the EVAMOSC data capability will directly support development and reporting of readiness metrics associated with implementation of the National Defense Strategy. In FY 2023, CAPE will continue to design and develop an enterprise data platform to serve as the authoritative source of O&S cost data for major weapon systems.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I</i> BA 6: <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0606100D8Z <i>I Budget and Program Assessments</i>
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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	10.099	15.438	0.000	-	0.000
Current President's Budget	10.729	13.994	15.244	-	15.244
Total Adjustments	0.630	-1.444	15.244	-	15.244
• Congressional General Reductions	-	-1.444			
• Congressional Directed Reductions	-0.002	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	1.000	-			
• SBIR/STTR Transfer	-0.368	-			
• Adjustments to Budget Year	-	-	15.244	-	15.244

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0606100D8Z / Budget and Program Assessments				Project (Number/Name) 101 / Budget and Program Assessments			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
101: Budget and Program Assessments	44.548	5.992	7.528	8.596	-	8.596	8.821	8.935	9.100	9.283	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program supports the Office of the Director, Cost Assessment & Program Evaluation (CAPE). It funds assessments that help to resolve budget and programmatic issues across the full range of the Department's activities. Projects that support this effort help to inform the leadership on program alternatives, capability concept development, design and cost, the appropriate balance of capabilities across the force, and also to identify how well the Department's expenditures are meeting its goals, and how well the force can implement the Defense strategy.

This program provides for analytical research across the entire spectrum of defense issues and concerns. The research agenda focuses on near to long-term problems identified by the Secretary of Defense, and addresses difficult and complex questions linked to program alternatives for current and future capabilities and forces in order to enhance DoD senior leadership's deliberations and decision-making.

This program provides the scientific and technical engineering services needed for research studies in the development of models and simulations and the evaluation of current analytical tools and scientific methods used to evaluate and assess weapons systems and warfighting capabilities for warfighting environments and scenarios, and related force structure. Deliverables from this program will include reports, briefings, and analyses designed to illuminate critical issues facing the Department. Outcomes include recommendations for new modeling techniques, programmatic alternatives, and scenario development.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: OSD Support for Programming Budget	5.992	7.528	8.596
Description: This program provides for analytical research across the entire spectrum of defense issues and concerns. The research agenda focuses on near to long-term problems identified by the Secretary of Defense, and addresses difficult and complex questions linked to program alternatives for current and future capabilities and forces in order to enhance senior leadership deliberations and decision-making.			
FY 2022 Plans: Studies, analyses, and assessments will be focused on: - Improving cost analysis tools to inform program, budget, and Defense Acquisition Board reviews.			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0606100D8Z / <i>Budget and Program Assessments</i>	Project (Number/Name) 101 / <i>Budget and Program Assessments</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>- Supporting the Weapon System Acquisition Reform Act (WSARA) requirements by independently assessing, analyzing, and where appropriate, updating cost indices, inflation rates, and escalation rates used in preparing the President's Budget for major acquisition programs.</p> <p>FY 2023 Plans: Studies, analyses, and assessments will be focused on:</p> <ul style="list-style-type: none"> - Improving cost analysis tools to inform program, budget, and Defense Acquisition Board reviews. - Supporting the Weapon System Acquisition Reform Act (WSARA) requirements by independently assessing, analyzing, and where appropriate, updating cost indices, inflation rates, and escalation rates used in preparing the President's Budget for major acquisition programs. - Facilitate CAPEs new role in the annual Sustainment Review and Independent Cost Estimate (ICE) process. <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 slight funding increase will support the development and maintenance of an enterprise database of actual operating and support costs, with internal adjustments to support priority requirements. Resources will fund a mix of research activities to carry out the plans stated above.</p>			
Accomplishments/Planned Programs Subtotals		5.992	7.528
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
A mix of competitive contracts with commercial firms and research provided by university-affiliated research centers (UARCs), and Federally Funded Research and Development Centers (FFRDCs).			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0606100D8Z / Budget and Program Assessments				Project (Number/Name) 118 / Enterprise VAMOSC			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
118: Enterprise VAMOSC	4.000	4.737	6.466	6.648	-	6.648	4.430	4.196	4.285	4.371	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
Enterprise Visibility and Management of Operating and Support Cost (EVAMOSC) addresses CAPE's responsibility to develop and maintain a database of actual operating and support (O&S) costs for major weapons systems, as required in 10 USC Ch. 137, Sec. 2337a and further refined by Sec. 832 of the 2019 National Defense Authorization Act (NDAA). Additionally, the EVAMOSC data capability will directly support development and reporting of readiness metrics associated with implementation of the National Defense Strategy.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: Enterprise Visibility and Maintainability of Operating and Support Costs (EVAMOSC)									4.737	6.466	6.648	
Description: EVAMOSC addresses CAPE's responsibility to develop and maintain a database of actual operating and support (O&S) costs for major weapons systems, as required in 10 USC Ch. 137, Sec. 2337a and further refined by Sec. 832 of the 2019 NDAA. Additionally, the EVAMOSC data capability will directly support development and reporting of readiness metrics associated with implementation of the National Defense Strategy.												
FY 2022 Plans: Design and develop an enterprise data platform to serve as the authoritative source of O&S cost data for major weapon systems: <ul style="list-style-type: none">Develop data ingestion pipelines, business rules, logic models, and data catalogues to support collection, reporting, and analysis of enterprise-level O&S cost data.Develop system administration, security, and user management functionality for an enterprise data asset anticipated to provide services to over 3,000 users across the DoD.												
FY 2023 Plans: Design and develop an enterprise data platform to serve as the authoritative source of O&S cost data for major weapon systems: <ul style="list-style-type: none">Develop data ingestion pipelines, business rules, logic models, and data catalogues to support collection, reporting, and analysis of enterprise-level O&S cost data.Develop system administration, security, and user management functionality for an enterprise data asset anticipated to provide services to over 3,000 users across the DoD.Construct an advanced database in GovCloud, acquire data from more than 75 source data systems, and map this data to all DoD weapons systems using standardized O&S cost data definitions.												
FY 2022 to FY 2023 Increase/Decrease Statement:												

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0606100D8Z / <i>Budget and Program Assessments</i>	Project (Number/Name) 118 / <i>Enterprise VAMOSC</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
FY 2023 slight funding increase support the development and maintenance of an enterprise database for actual operating and support costs. The associated funding will be prioritized to continue this important Congressional interest to improve O&S cost data collection. Resources will fund a mix of research activities to carry out the plans stated above.			
Accomplishments/Planned Programs Subtotals		4.737	6.466
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
N/A			
D. Acquisition Strategy			
A mix of competitive contracts with commercial firms and research provided by university-affiliated research centers (UARCs) and Federally Funded Research and Development Centers (FFRDCs).			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 6: RDT&E Management Support</i>	PE 0606114D8Z I <i>Support for Analysis Working Group</i>											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	4.700	-	4.700	4.700	4.700	4.700	4.700	Continuing	Continuing
109: <i>Analysis Working Group Support</i>	-	0.000	0.000	4.700	-	4.700	4.700	4.700	4.700	4.700	Continuing	Continuing

Note

New Start (Y/N): Yes

A. Mission Description and Budget Item Justification

This program supports the Department's initiative to Take Care of People, and Build Sustainable and Long-Term Advantage.

This program supports the Office of the Director, Cost Assessment &Program Evaluation (CAPE).It funds assessments that help the Analysis Working Group (AWG) to assist the Secretary and Deputy Secretary in guiding the analytic community and ensuring strategic analysis products are robust and of the highest quality. The end goal is an analytic enterprise that is agile, responsive, and provides sound decision support for the Secretary and Deputy Secretary. This program provides for analytic research across the Department to guide reform of the Departments analytic enterprise. Projects that support this effort help to develop a high performing and innovative analytic enterprise with the right policies, structures, people, and tools to support timely strategic decision that create an advantage for the U.S Military now and into the future.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	4.700	-	4.700
Total Adjustments	0.000	0.000	4.700	-	4.700
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Year	-	-	4.700	-	4.700

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support	R-1 Program Element (Number/Name) PE 0606114D8Z / Support for Analysis Working Group	
<div>Change Summary Explanation</div> <div>New start in FY 2023. Increase in FY 2023 attributed to the Deputy Secretary of Defense mandate in establishing the Analysis Working Group for long-term development efforts across the Department to advance studies and applicable initiatives. Funding will prioritize studies and reform the analytic enterprise with the right tools and information to support operational strategic choices.</div>		

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0606114D8Z / Support for Analysis Working Group				Project (Number/Name) 109 / Analysis Working Group Support			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
109: Analysis Working Group Support	-	0.000	0.000	4.700	-	4.700	4.700	4.700	4.700	4.700	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
This program supports the Office of the Director, Cost Assessment & Program Evaluation (CAPE). It funds assessments that help the Analysis Working Group (AWG) to assist the Secretary and Deputy Secretary in guiding the analytic community and ensuring strategic analysis products are robust and of the highest quality. The end goal is an analytic enterprise that is agile, responsive, and provides sound decision support for the Secretary and Deputy Secretary. This program provides for analytic research across the Department to guide reform of the Departments analytic enterprise. Projects that support this effort help to develop a high performing and innovative analytic enterprise with the right policies, structures, people, and tools to support timely strategic decisions that create an advantage for the U.S Military now and into the future.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: Analysis Working Group Support									0.000	0.000	4.700	
Description: The Analysis Working Group (AWG) was established to marshal and guide the Department’s analytic capabilities. This group is advancing key strategic priorities by improving the analytic underpinning available for senior leader decisions and addressing necessary enterprise reforms (e.g., data sharing and knowledge management) across the analytic community.												
FY 2022 Plans: N/A												
FY 2023 Plans: Studies, analysis and assessments will be focused on: -Establishing clear priorities and standards to focus analyst on decision support -Improving transparency across the analytic community -Improving the quality of and expanding access to data -Evolve the methods and tools used in strategic analysis												
FY 2022 to FY 2023 Increase/Decrease Statement: The increase in FY23 is attributed to the Deputy Secretary of Defense mandate in establishing the Analysis Working Group for long-term development efforts across the Department to advance studies and applicable initiatives. Funding will prioritize studies and reform the analytic enterprise with the right tools and information to support operational strategic choices.												
Accomplishments/Planned Programs Subtotals									0.000	0.000	4.700	

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0606114D8Z / <i>Support for Analysis Working Group</i>	Project (Number/Name) 109 / <i>Analysis Working Group Support</i>
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy A mix of research provided by university-affiliated research centers (UARCs), Federally Funded Research and Development Centers (FFRDCs) and competitive contracts with commercial firms.		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 6: RDT&E Management Support</i>					PE 0606135D8Z I <i>Chief Digital Artificial Intelligence Officer</i>							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	13.132	-	13.132	17.247	9.243	5.464	5.672	Continuing	Continuing
069: <i>Artificial Intelligence & Machine Learning Technologies</i>	-	0.000	0.000	13.132	-	13.132	17.247	9.243	5.464	5.672	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to build enduring advantage and build a resilient Joint Force and defense ecosystem. On December 8, 2021, the Deputy Secretary of Defense (DSD) issued a memo establishing the Chief Digital and Artificial Intelligence Officer (CDAO) as the Department's senior official responsible for strengthening and integrating data, artificial intelligence, and digital solutions in the Department. The memorandum establishes the CDAO as the "successor organization to the Joint Artificial Intelligence Center (JAIC)". The CDAO reached Initial Operational Capacity (IOC) on February 1, 2022 and will integrate the JAIC, the Defense Digital Service (DDS), the Office of the Chief Data Officer (OCDO), and the Advancing Analytics (Advana) office from OUSD(Comptroller) as it approaches Full Operational Capacity (FOC) on June 1, 2022.

The integration of the JAIC, OCDO, DDS, and Advana into the CDAO more comprehensively restructures how the Department approaches the complex and dynamic challenges of becoming a digital, data, and Artificial Intelligence (AI) enabled enterprise capable of operating at the speed and scale necessary to accelerate the Department's adoption of data, analytics, and AI to preserve decision advantage.

The functions of the CDAO are as follows: lead and oversee DoD's strategy development and policy formulation for data, analytics, and AI; break down barriers to data and AI adoption; create enabling digital infrastructure and services; selectively scale and provide digital and AI-enabled solutions focused on enterprise and joint use cases; and surge digital services. This also requires CDAO to integrate the capabilities, personnel, resources, and governance of its constituent organizations, while concurrently sustaining momentum on priority projects that align to CDAO's mission. These include expanding the enterprise data repository; establishing a responsible AI ecosystem; developing the AI and Data Accelerator (ADA) initiative; and developing a Data, Analytics, and AI Adoption Strategy. These various lines of effort will support the overarching mission of accelerating the Department's adoption of data, analytics, and AI to preserve decision advantage across the Joint Force.

This exhibit encompasses two activities: AI Acquisition Training and Responsible AI (RAI) and AI Governance Tools.

The DoD must overhaul its acquisition processes and prioritize technical and acquisition training as highlighted in the 2018 National Defense Strategy, the 2018 DoD Artificial Intelligence Strategy, and the 2021 National Security Commission on Artificial Intelligence (NSCAI) Final Report. This funding will provide the basis of the training platform -Digital DNA Pilot Program- in partnership with OUSD(A&S).

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I</i> BA 6: <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0606135D8Z / <i>Chief Digital Artificial Intelligence Officer</i>
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It is also incumbent on the Department to ensure all its AI-enabled systems will be safe and adhere to ethical standards and that they are used in a manner that contributes to the efficiency, effectiveness, and legitimacy of the Department's AI capabilities. This requirement funds activities to develop, procure and maintain the necessary commercial and DoD-customized tools to put the DoD AI Ethical Principles into practice across the entire AI product lifecycle. RAI leaders across the Department are going to need access to and utilize tools that support the capability development process, including in areas of explainability of models, bias detection, and other areas necessary for RAI. This requirement provides for the integration of commercially available tools to include an Explainable AI tool, Synthetic Data & Anonymization tool, Data Management and Traceability tool, Continuous Integration/Continual Delivery tool, Auto-Machine Learning tool, Bias Mitigation tool, and the Interference Time tool into the Joint Common Foundation (JCF), which will embed the operationalization of the DoD AI Ethics Principles into the developer's workflow. By doing so, these tools will not only provide technical assessments through the project lifecycle, but also allow for traceability and reliability to ensure safe and ethical systems from design to development and deployment to use. This requirement also funds the development of DoD-customized assessments and tools that RAI leads will use across the AI product and acquisition lifecycles.

B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	13.132	-	13.132
Total Adjustments	0.000	0.000	13.132	-	13.132
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustment to the Budget Year	-	-	13.132	-	13.132

Change Summary Explanation

This exhibit will fund two new activities: AI Acquisition Training (\$6.695M), and RAI and AI Governance Tools (\$6.437M).

The DoD must overhaul its acquisition processes and prioritize technical and acquisition training as highlighted in the 2018 National Defense Strategy, the 2018 DoD Artificial Intelligence Strategy, and the 2021 NSCAI Final Report. This new growth funding will provide the basis of the training platform -Digital DNA Pilot Program- in partnership with OUSD(A&S).

It is also incumbent on the Department to ensure all its AI-enabled systems will be safe and adhere to ethical standards and that they are used in a manner that contributes to the efficiency, effectiveness, and legitimacy of the Department's AI capabilities. This requirement funds activities to develop, procure and maintain the necessary commercial and DoD-customized tools to put the DoD AI Ethical Principles into practice across the entire AI product lifecycle. RAI leaders across the Department are going to need access to and utilize tools that support the capability development process, including in areas of explainability of models, bias detection, and other areas necessary for RAI. This requirement provides for the integration of commercially available tools to include an Explainable AI tool,

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support	R-1 Program Element (Number/Name) PE 0606135D8Z / Chief Digital Artificial Intelligence Officer	
Synthetic Data & Anonymization tool, Data Management and Traceability tool, Continuous Integration/Continual Delivery tool, Auto-Machine Learning tool, Bias Mitigation tool, and the Interference Time tool into the JCF, which will embed the operationalization of the DoD AI Ethics Principles into the developer's workflow. By doing so, these tools will not only provide technical assessments through the project lifecycle, but also allow for traceability and reliability to ensure safe and ethical systems from design to development and deployment to use. This requirement also funds the development of DoD-customized assessments and tools that RAI leads will use across the AI product and acquisition lifecycles.		

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0606135D8Z / Chief Digital Artificial Intel ligence Officer				Project (Number/Name) 069 / Artificial Intelligence & Machine Learning Technologies			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
069: Artificial Intelligence & Machine Learning Technologies	-	0.000	0.000	13.132	-	13.132	17.247	9.243	5.464	5.672	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project encompasses two activities: AI Acquisition Training and RAI and AI Governance Tools.

The DoD must overhaul its acquisition processes and prioritize technical and acquisition training as highlighted in the National Defense Strategy for 2018, the 2018 DoD Artificial Intelligence Strategy, and the 2021 NSCAI Final Report. This funding will provide the basis of the training platform -Digital DNA Pilot Program- in partnership with OUSD(A&S).

It is also incumbent on the Department to ensure all its AI-enabled systems will be safe and adhere to ethical standards and that they are used in a manner that contributes to the efficiency, effectiveness, and legitimacy of the Department's AI capabilities. This requirement funds activities to develop, procure and maintain the necessary commercial and DoD-customized tools to put the DoD AI Ethical Principles into practice across the entire AI product lifecycle. RAI leaders across the Department are going to need access to and utilize tools that support the capability development process, including in areas of explainability of models, bias detection, and other areas necessary for RAI. This requirement provides for the integration of commercially available tools to include an Explainable AI tool, Synthetic Data & Anonymization tool, Data Management and Traceability tool, Continuous Integration/Continual Delivery tool, Auto-Machine Learning tool, Bias Mitigation tool, and the Interference Time tool into the JCF, which will embed the operationalization of the DoD AI Ethics Principles into the developer's workflow. By doing so, these tools will not only provide technical assessments through the project lifecycle, but also allow for traceability and reliability to ensure safe and ethical systems from design to development and deployment to use. This requirement also funds the development of DoD-customized assessments and tools that RAI leads will use across the AI product and acquisition lifecycles.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Artificial Intelligence (AI) Acquisition Training	0.000	-	6.695
Description: The DoD must overhaul its acquisition processes and prioritize technical and acquisition training as highlighted in the National Defense Strategy for 2018, the DoD Artificial Intelligence Strategy for 2018, and the 2021 NSCAI Final Report. This funding is earmarked to provide the basis of the training platform - DoD AI Acquisition Training Platform - in partnership with OUSD(A&S).			
FY 2023 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 6		R-1 Program Element (Number/Name) PE 0606135D8Z / <i>Chief Digital Artificial Intel ligence Officer</i>		Project (Number/Name) 069 / <i>Artificial Intelligence & Machine Learning Technologies</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
In FY 2023, CDAO plans to develop AI-specific acquisition content for existing Defense Acquisition University platforms and to build a DoD AI training portal for DoD components acquiring AI capabilities.					
FY 2022 to FY 2023 Increase/Decrease Statement: The DoD must overhaul its acquisition processes and prioritize technical and acquisition training as highlighted in the 2018 National Defense Strategy, the DoD Artificial Intelligence Strategy for 2018, and the 2021 NSCAI Final Report. This new growth funding is earmarked to provide the basis of the training platform - DoD AI Acquisition Training Platform - in partnership with OUSD(A&S).					
Title: Responsible Artificial Intelligence (RAI) and Artificial Intelligence (AI) Governance Tools Description: It is incumbent on the Department to ensure all its AI-enabled systems will be safe and adhere to ethical standards and that they are used in a manner that contributes to the efficiency, effectiveness, and legitimacy of the Department's AI capabilities. This requirement funds activities to develop, procure and maintain the necessary commercial and DoD-customized tools to put the DoD AI Ethical Principles into practice across the entire AI product lifecycle. RAI leaders across the Department are going to need access to and utilize tools that support the capability development process, including in areas of explainability of models, bias detection, and other areas necessary for RAI. This requirement provides for the integration of commercially available tools to include an Explainable AI tool, Synthetic Data & Anonymization tool, Data Management and Traceability tool, Continuous Integration/Continual Delivery tool, Auto-Machine Learning tool, Bias Mitigation tool, and the Interference Time tool into the JCF, which will embed the operationalization of the DoD AI Ethics Principles into the developer's workflow. By doing so, these tools will not only provide technical assessments through the project lifecycle, but also allow for traceability and reliability to ensure safe and ethical systems from design to development and deployment to use. This requirement also funds the development of DoD-customized assessments and tools that RAI leads will use across the AI product and acquisition lifecycles. FY 2023 Plans: In FY 2023, CDAO Plans to develop and maintain the DoD AI Inventory tool and customized DoD governance tools, and to procure and maintain commercially available tools to support RAI activities. FY 2022 to FY 2023 Increase/Decrease Statement: It is incumbent on the Department to ensure all its AI-enabled systems will be safe and adhere to ethical standards and that they are used in a manner that contributes to the efficiency, effectiveness, and legitimacy of the Department's AI capabilities. This new growth funds activities to develop, procure and maintain the necessary commercial and DoD-customized tools to put the DoD AI Ethical Principles into practice across the entire AI product lifecycle. RAI leaders across the Department are going to need access to and utilize tools that support the capability development process, including in areas of explainability of models, bias detection, and other areas necessary for RAI. This requirement provides for the integration of commercially available tools to include an Explainable AI tool, Synthetic Data & Anonymization tool, Data Management and Traceability tool, Continuous			0.000	-	6.437

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0606135D8Z / <i>Chief Digital Artificial Intel ligence Officer</i>	Project (Number/Name) 069 / <i>Artificial Intelligence & Machine Learning Technologies</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
Integration/Continual Delivery tool, Auto-Machine Learning tool, Bias Mitigation tool, and the Interference Time tool into the JCF, which will embed the operationalization of the DoD AI Ethics Principles into the developer's workflow. By doing so, these tools will not only provide technical assessments through the project lifecycle, but also allow for traceability and reliability to ensure safe and ethical systems from design to development and deployment to use. This new growth also funds the development of DoD-customized assessments and tools that RAI leads will use across the AI product and acquisition lifecycles.			
Accomplishments/Planned Programs Subtotals		0.000	-
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support	R-1 Program Element (Number/Name) PE 0606225D8Z / ODNA Technology & Resource Analysis											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	8.719	3.200	4.897	3.323	-	3.323	3.367	3.406	3.478	3.548	-	-
106: Technology and Resource Analysis	8.719	3.200	4.897	3.323	-	3.323	3.367	3.406	3.478	3.548	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Defend the Homeland, Deter Aggression and Prevail in Conflict, and Build Enduring Advantage. The Office of Net Assessment develops and coordinates analyses that examine the standing trends and future prospects of U.S. and other military capabilities and military potential. The net assessments address near and long-term problems and opportunities for the U.S. military forces to help counter technological advantages of potential adversaries of the United States. These efforts will pursue research to analyze the future security environment.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	3.200	3.088	0.000	0.000	0.000
Current President's Budget	3.200	4.897	3.323	-	3.323
Total Adjustments	0.000	1.809	3.323	-	3.323
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	2.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• 200 Series_EA-008 -800_Series_INV-001-Underexecution_Review	-	-0.010	0.115	-	0.115
• 710_Series_EA-008-Inflation Rates for Non-Pay and Non-Fuel Purchases(U)	-	-0.027	-	-	-
• 800_Series_INV-001-Underexecution_Review	-	-0.154	-	-	-
• Budget Year Adjustment	-	-	3.208	-	3.208

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 6:</i> <i>RDT&E Management Support</i>		R-1 Program Element (Number/Name) PE 0606225D8Z I <i>ODNA Technology & Resource Analysis</i>	

<u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u> Project: 106: <i>Technology and Resource Analysis</i> Congressional Add: <i>FY 2022 Conference Appropriated (H.R. 2471):ODNA Technology and Resource Analysis</i> <div style="text-align: right; margin-right: 50px;">Congressional Add Subtotals for Project: 106</div> <div style="text-align: right; margin-right: 100px;">Congressional Add Totals for all Projects</div>	FY 2021	FY 2022
	-	2.000
	-	2.000
	-	2.000

Change Summary Explanation

FY2022 funding increase reflects H.R. 2471 Conference Appropriated congressional add for ODNA Technology and Resource Analysis: Rapidly scalable resilient communications.

FY funding decrease inflation rates for pay/non-pay and fuel/non-fuel purchases.

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0606225D8Z / ODNA Technology & Resource Analysis				Project (Number/Name) 106 / Technology and Resource Analysis			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
106: Technology and Resource Analysis	8.719	3.200	4.897	3.323	-	3.323	3.367	3.406	3.478	3.548	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The Office of Net Assessment develops and coordinates analyses that examine the standing trends and future prospects of U.S. and other military capabilities and military potential. The net assessments address near and long-term problems and opportunities for the U.S. military forces to help counter technological advantages of potential adversaries of the United States. These efforts will pursue research to analyze the future security environment.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: Technology and Resource Analysis									3.200	2.897	3.323	
Description: The Office of Net Assessment develops and coordinates analyses that examine the standing trends and future prospect of U.S. and other military capabilities and military potential. The net assessments address near and long-term problems and opportunities for the U.S. military forces to help counter technological advantages of potential adversaries of the United States. These efforts will pursue research to analyze the future security environment.												
FY 2022 Plans: Continue and initiate efforts to pursue research that identifies new technological innovations and analyzes the future security environment, including: - Continuing analysis on future concepts of operation and possible courses of action and responses to emerging capabilities. - Continuing investment in a Biosciences Net Assessment and initiating analysis in future warfare areas to assess potential revolutionary advances. - Initiating analysis in information areas for potential advanced capability demonstrations and a potential Net Assessment.												
FY 2023 Plans: Continue and initiate efforts to pursue research that identifies new technological innovations and analyzes the future security environment, including: - Continuing analysis on future concepts of operation and possible courses of action and responses to emerging capabilities. - Continuing investment in a Biosciences Net Assessment and initiating analysis in future warfare areas to assess potential revolutionary advances. - Initiating analysis in information areas for potential advanced capability demonstrations and a potential Net Assessment.												
FY 2022 to FY 2023 Increase/Decrease Statement:												

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0606225D8Z / <i>ODNA Technology & Resource Analysis</i>	Project (Number/Name) 106 / <i>Technology and Resource Analysis</i>	

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
The FY 2023 increase funds inflation rates for non-pay and non-fuel purchases.			
Accomplishments/Planned Programs Subtotals	3.200	2.897	3.323

	FY 2021	FY 2022
Congressional Add: FY 2022 Conference Appropriated (H.R. 2471):ODNA Technology and Resource Analysis	-	2.000
FY 2022 Plans: FY2022 funding increase reflects H.R. 2471 Conference Appropriated congressional add for ODNA Technology and Resource Analysis to support rapidly scalable resilient communications.		
Congressional Adds Subtotals	-	2.000

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0606300D8Z I <i>Defense Science Board</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	2.532	-	2.532	2.394	2.433	2.579	2.631	Continuing	Continuing
807: <i>Defense Science Board</i>	-	0.000	0.000	2.532	-	2.532	2.394	2.433	2.579	2.631	Continuing	Continuing

Note

New Start (Y/N): Yes

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Build Long-Term Advantage, and Build a Resilient Joint Force and Defense Ecosystem.

The Secretary of Defense, in accordance with the Federal Advisory Committee Act (FACA) (5 U.S.C., Appendix) and 41 C.F.R. § 102- 3.50(d), established the Defense Science Board (DSB) as a discretionary advisory committee. The DSB provides independent advice to the Under Secretary of Defense for Research & Engineering, the Secretary of Defense, the Deputy Secretary of Defense, the Chairman of the Joint Chiefs of Staff, and other Department officials for all matters relating to the acquisition processes, research and development, manufacturing, production, and logistics; command, control, communications and intelligence activities related to acquisition, military construction and procurement. The DSB is concerned with the pressing and complex technological problems facing the DoD in such areas as research, engineering, organizational structure and process, business and functional concepts, and manufacturing, and ensures the identification of new technologies and new applications of technology in those areas to strengthen national security.

This funding provides the vital contracting staff support services which are critical to the success of the DSB. The funds provided allows for the procurement of professional, analytical, and administrative services, to include the tasks of planning, preparation, execution, administrative support, logistics, and documentation for Subcommittee meetings and conferences. The vendors also provide essential services in support of the DSB and the DSB staff in the following areas: technical, business, and administrative planning; organizing, managing, coordinating, and tracking (e.g., cost, schedule, and deliverables); and performance management, data management, and subcontract management along with refining initial and final reports of the various study groups.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 6:</i> <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0606300D8Z / <i>Defense Science Board</i>
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B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	2.532	-	2.532
Total Adjustments	0.000	0.000	2.532	-	2.532
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Funding Realigned from O&M Project 2506	-	-	2.532	-	2.532

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0606300D8Z / Defense Science Board				Project (Number/Name) 807 / Defense Science Board			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
807: Defense Science Board	-	0.000	0.000	2.532	-	2.532	2.394	2.433	2.579	2.631	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This is a new start program.

A. Mission Description and Budget Item Justification

The Secretary of Defense, in accordance with the Federal Advisory Committee Act (FACA) (5 U.S.C., Appendix) and 41 C.F.R. § 102- 3.50(d), established the Defense Science Board (DSB) as a discretionary advisory committee. The DSB provides independent advice to the Under Secretary of Defense for Research & Engineering, the Secretary of Defense, the Deputy Secretary of Defense, the Chairman of the Joint Chiefs of Staff, and other Department officials for all matters relating to the acquisition processes, research and development, manufacturing, production, and logistics; command, control, communications and intelligence activities related to acquisition, military construction and procurement. The DSB is concerned with the pressing and complex technological problems facing the DoD in such areas as research, engineering, organizational structure and process, business and functional concepts, and manufacturing, and ensures the identification of new technologies and new applications of technology in those areas to strengthen national security.

Contracted services are critical to the success of the DSB. The funds provided allows for the procurement of professional, analytical, and administrative services, to include the tasks of planning, preparation, execution, administrative support, logistics, and documentation for Subcommittee meetings and conferences. The vendors also provide essential services in support of the DSB and the DSB staff in the following areas: technical, business, and administrative planning; organizing, managing, coordinating, and tracking (e.g., cost, schedule, and deliverables); and performance management, data management, and subcontract management along with refining initial and final reports of the various study groups.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Defense Science Board	-	-	2.532
Description: The Secretary of Defense, in accordance with the Federal Advisory Committee Act (FACA) (5 U.S.C., Appendix) and 41 C.F.R. § 102- 3.50(d), established the Defense Science Board (DSB) as a discretionary advisory committee. The DSB provides independent advice to the Under Secretary of Defense for Research & Engineering, the Secretary of Defense, the Deputy Secretary of Defense, the Chairman of the Joint Chiefs of Staff, and other Department officials for all matters relating to the acquisition processes, research and development, manufacturing, production, and logistics; command, control, communications and intelligence activities related to acquisition, military construction and procurement. The DSB is concerned with the pressing and complex technological problems facing the DoD in such areas as research, engineering, organizational structure and process, business and functional concepts, and manufacturing, and ensures the identification of new technologies and new applications of technology in those areas to strengthen national security.			
FY 2023 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0606300D8Z / <i>Defense Science Board</i>	Project (Number/Name) 807 / <i>Defense Science Board</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>Contracted services are critical to the success of the DSB. The funds provided allows for the procurement of professional, analytical, and administrative services, to include the tasks of planning, preparation, execution, administrative support, logistics, and documentation for Subcommittee meetings and conferences. The vendors also provide essential services in support of the DSB and the DSB staff in the following areas: technical, business, and administrative planning; organizing, managing, coordinating, and tracking (e.g., cost, schedule, and deliverables); and performance management, data management, and subcontract management along with refining initial and final reports of the various study groups.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i></p> <p>The funding will provide for contracted services in support of the Defense Science Board to plan, prepare, and execute the program.</p>			
Accomplishments/Planned Programs Subtotals		-	2.532
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support	PE 0606771D8Z / Cyber Resiliency & Cybersecurity Policy											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	31.460	32.306	-	32.306	31.813	30.476	30.198	30.153	Continuing	Continuing
145: Cyber Resiliency & Cybersecurity Policy	0.000	0.000	31.460	32.306	-	32.306	31.813	30.476	30.198	30.153	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Defend the Homeland, and Build Sustainable and Long-Term Advantage.

The Cyber Resiliency & Cybersecurity Policy program supports the efforts of OUSD A&S, focusing on the defense of the Department's critical mission weapon systems and Defense Critical Infrastructure from cyber attack, protecting the Department's sensitive unclassified information residing within the Defense Industrial Base (DIB) sector and supply chain, and capability portfolio management for Joint Cyber Capabilities used by the Cyber Mission Force. This program funds the following critical efforts:

1) Cybersecurity for Weapon Systems and Critical Infrastructure: Lead the Department's Strategic Cybersecurity Program (SCP) to continue critical weapon systems and defense infrastructure cybersecurity assessments and mitigations.

CISO(A&S) Cyber Resiliency efforts are aligned with the following initiatives:

Assess:

- Conduct of mission focused cyber risk assessments for priority Defense Missions in support of CCMDs.
- Conduct Deep Cyber Resiliency Assessments (DCRA) in support of CCMDs and asset owners.

Inventory:

- Develop, sustain, and employ Cyber Risk Mitigation Tool (CRMT), an Enterprise-wide decision support tool for tracking cyber vulnerability assessments and mitigations.

Prioritize:

- Prioritize Cyber Risk Mitigations based upon mission analysis conducted by Mission Focused Cyber Hardening Teams.

2) DIB Cybersecurity:

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I</i> BA 6: <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0606771D8Z <i>I Cyber Resiliency & Cybersecurity Policy</i>
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Development, implementation and sustainment of the Cybersecurity Maturity Model Certification (CMMC) framework that incorporates NIST SP 800-171 standards and references into a unified standard that encompasses the progression of cybersecurity practices to secure Controlled Unclassified Information (CUI) within the Defense Industrial Base (DIB) sector.

Conduct pathfinders to assess the feasibility and efficacy of employing emerging commercial services/tools/platforms that provide insights into cybersecurity threats and vulnerabilities that are relevant to the DIB sector and the DoD supply chain.

Partner with the DIB sector to demonstrate cost-effective and scalable cybersecurity services that augment and/or enhance existing commercial capabilities and services. Focus on cybersecurity services for small-to-medium sized DIB companies that are critical to the DoD supply chain but lack sufficient cybersecurity capabilities to protect CUI.

B. Program Change Summary (\$ in Millions)	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	0.000	31.638	0.000	-	0.000
Current President's Budget	0.000	31.460	32.306	-	32.306
Total Adjustments	0.000	-0.178	32.306	-	32.306
• Congressional General Reductions	-	-0.178			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Year	-	-	32.306	-	32.306

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0606771D8Z / Cyber Resiliency & Cyber security Policy				Project (Number/Name) 145 / Cyber Resiliency & Cybersecurity Policy			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
145: Cyber Resiliency & Cybersecurity Policy	0.000	0.000	31.460	32.306	-	32.306	31.813	30.476	30.198	30.153	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Cyber Resiliency & Cybersecurity Policy program supports the efforts of OUSD A&S, focusing on the defense of the Department's critical mission weapon systems and Defense Critical Infrastructure from cyber attack, protecting the Department's sensitive unclassified information residing within the Defense Industrial Base (DIB) sector and supply chain, and capability portfolio management for Joint Cyber Capabilities used by the Cyber Mission Force. This program funds the following critical efforts:

1) Cybersecurity for Weapon Systems and Critical Infrastructure: Lead the Department's Strategic Cybersecurity Program (SCP) to continue critical weapon systems and defense infrastructure cybersecurity assessments and mitigations.

CISO(A&S) Cyber Resiliency efforts are aligned with the following initiatives:

Assess:

- Conduct of mission focused cyber risk assessments for priority Defense Missions in support of CCMDs.
- Conduct Deep Cyber Resiliency Assessments (DCRA) in support of CCMDs and asset owners.

Inventory:

- Develop, sustain, and employ Cyber Risk Mitigation Tool (CRMT), an Enterprise-wide decision support tool for tracking cyber vulnerability assessments and mitigations.

Prioritize:

- Prioritize Cyber Risk Mitigations based upon mission analysis conducted by Mission Focused Cyber Hardening Teams.

2) DIB Cybersecurity:

Development, implementation and sustainment of the Cybersecurity Maturity Model Certification (CMMC) framework that incorporates NIST SP 800-171 standards and references into a unified standard that encompasses the progression of cybersecurity practices to secure Controlled Unclassified Information (CUI) within the Defense Industrial Base (DIB) sector.

Conduct pathfinders to assess the feasibility and efficacy of employing emerging commercial services/tools/platforms that provide insights into cybersecurity threats and vulnerabilities that are relevant to the DIB sector and the DoD supply chain.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 6		R-1 Program Element (Number/Name) PE 0606771D8Z / Cyber Resiliency & Cyber security Policy	Project (Number/Name) 145 / Cyber Resiliency & Cybersecurity Policy		
Partner with the DIB sector to demonstrate cost-effective and scalable cybersecurity services that augment and/or enhance existing commercial capabilities and services. Focus on cybersecurity services for small-to-medium sized DIB companies that are critical to the DoD supply chain but lack sufficient cybersecurity capabilities to protect CUI.					
.					
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Title: Cyber Resiliency & Cybersecurity Policy			-	31.460	32.306
Description: FY 2021 Accomplishments for this program are reported under PE 0604771D8Z, Joint Tactical Information Distribution System.					
FY 2022 Plans: Cybersecurity for Weapon Systems and Defense Critical Infrastructure (DCI): - Lead the Department's Strategic Cybersecurity Program (SCP) to continue critical weapon systems and defense infrastructure cybersecurity assessments and mitigations. - Develop, update, and refine cybersecurity Policy. - Support cybersecurity reviews of MDAPs where USD(A&S) is the MDA. -Conduct SCP Pilots to inform cybersecurity best practices for weapon systems in development using multiple acquisition pathways.					
Perform Mission Level Cyber Risk Assessments (CRAs): 1) Plan and Execute Mission Resiliency (MR) I in coordination with the USTRANSCOM and USECUOM. 2) Plan and Execute MR II in collaboration with USSPACECOM. 3) Perform Deep Cyber Resiliency Assessments (DCRAS) in support of CCMD priorities. - Prioritize Mitigations based upon mission analysis conducted by Mission Focused Cyber Hardening Teams. Develop and deploy the CRMT to maintain a Master Cyber Risk Inventory for the Department of Defense for Weapon Systems and DCI based upon CRAs/DCRAs, and other assessments. Capability Portfolio Management for Cyber Capabilities: - Advance and mature capabilities for conducting mission engineering for cyberspace operations. - Manage the portfolio of Joint Cyber Warfighting Architecture (JCWA) components to enable the cyber mission force to efficiently and effectively conduct offensive and defensive cyber missions. Support offensive and defensive architecture development and portfolio management in collaboration with USCYBERCOM. - As PSA OPR for the UP, oversee the Air Force's, as DoD EA, capability development via portfolio management and governance. Assess UP's interfaces, dependencies, and linkages with other components of the JCWA to integrate and analyze data from offensive and defensive operations and enable effective and efficient offensive and defensive effects.					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 6		R-1 Program Element (Number/Name) PE 0606771D8Z / <i>Cyber Resiliency & Cyber security Policy</i>		Project (Number/Name) 145 / <i>Cyber Resiliency & Cybersecurity Policy</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>- Manage the portfolio of DoD cyber training systems; including the DoDs PCTE and govern the PCTE as a member of the PCTE governance boards.</p> <p>Defense Industrial Base (DIB) Cybersecurity:</p> <ul style="list-style-type: none"> - Update and refine CMMC framework based on emerging cyber threats, adjudication of public comments to the interim rule, and outputs from the initial phased rollout. - Conduct CMMC pilots and risk reduction pathfinders with Services, Agencies, and/or international partners to support the phased rollout. - Plan for the phased rollout of acquisitions that implement enhanced cybersecurity requirements and acquisitions with international contractors/subcontractors within the multi-tier supply chain. - Test and demonstrate full operational capability of the CMMC Enterprise Mission Assurance Support Service (eMASS) database and infrastructure. - Partner with the DIB sector to analyze and demonstrate promising and cost-effective capabilities and candidate solutions related to supply chain risk management and DIB cybersecurity. - Work with DoD stakeholders and appropriate organizations dedicated to enhancing the training and education of cybersecurity best practices to the DIB sector with an emphasis on small businesses and manufacturers. <p>FY 2023 Plans:</p> <p>Cybersecurity for Weapon Systems and Defense Critical Infrastructure (DCI):</p> <ul style="list-style-type: none"> - Lead the Department's Strategic Cybersecurity Program (SCP) to continue critical weapon systems and defense critical infrastructure cybersecurity assessments and mitigations. - Develop, update, and refine cybersecurity Policy. - Support cybersecurity reviews of MDAPs where USD(A&S) is the MDA. <p>Develop enduring solutions for the Department on future assessments and mitigations.</p> <ul style="list-style-type: none"> - Conduct SCP Pilots to inform cybersecurity best practices for weapon systems in development using multiple acquisition pathways. - Perform Mission Level Cyber Risk Assessments (CRAs): <ol style="list-style-type: none"> 1) Plan and Execute Mission Resiliency (MR) II in coordination with the USTRANSCOM and USEUCOM. 2) Plan and Execute MR III in collaboration with USNORTHCOM 3) Perform Deep Cyber Resiliency Assessments (DCRAs) in support of CCMD priorities. - Prioritize Mitigations and vulnerabilities based upon mission analyses conducted by Mission Focused Cyber Hardening Teams, DCRAs, wargaming, and program management office assessments. - Oversee and track Service/Agency execution of system-level cyber vulnerability assessments for additional priority weapons systems added in JROCM 039-26. 					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0606771D8Z / <i>Cyber Resiliency & Cyber security Policy</i>	Project (Number/Name) 145 / <i>Cyber Resiliency & Cybersecurity Policy</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<ul style="list-style-type: none"> - Lead Weapons Systems Cybersecurity Council of Colonels, with representation from US Air Force, US Army, US Navy, US Marine Corps, PCA, DoD CIO, Joint Staff J6. - Lead Cybersecurity Community of Practice (CCOP) with OUSD(R&E) to foster sharing of vital cybersecurity information and best practices across the DoD Community. - Participate in PCA-led DoD Cyber Strategy Line of Effort 9, focused on Mission Assurance for weapons systems and critical infrastructure. <p>Capability Portfolio Management for Cyber Capabilities:</p> <ul style="list-style-type: none"> - Advance and mature capabilities for conducting mission engineering for cyberspace operations. - Manage the portfolio of Joint Cyber Warfighting Architecture (JCWA) components to enable the cyber mission force to efficiently and effectively conduct offensive and defensive cyber missions. Support offensive and defensive architecture development and portfolio management in collaboration with USCYBERCOM. - As PSA OPR for the United Platform (UP), oversee the Air Force's, as DoD EA, capability development via portfolio management and governance. Assess UP's interfaces, dependencies, and linkages with other components of the JCWA to integrate and analyze data from offensive and defensive operations and enable effective and efficient offensive and defensive effects. - As PSA OPR for the UP component of JCWA, assess the effectiveness of USCYBERCOM requirements generation, mission engineering, and capability prioritization for UP acquisition. Assess the timeliness and effectiveness of UP acquisition in response to USCYBERCOM requirements and involvement in and impact on the mission engineering process. Assess the maturity of UP's Software Acquisition Pathway (SWaP) implementation and coordinate any necessary modifications to DoD SWaP policy. - Manage the portfolio of DoD cyber training systems; including the DoDs PCTE and govern the PCTE as a member of the PCTE governance boards. - Conduct Cybersecurity review of Joint Cyber Capabilities in development to enhance the Cybersecurity of Weapon Systems in development and sustainment. <p>Defense Industrial Base (DIB) Cybersecurity:</p> <ul style="list-style-type: none"> - Implement the revised Cybersecurity Maturity Model Certification (CMMC) framework based on the outcome of rulemaking, emerging cyber threats, and DoD leadership decisions. - Execute CMMC Pilots in concert with Military Services, DoD agencies, and international partners in support of the CMMC roll-out. - Conduct risk reduction pathfinders on the implementation of CMMC Level 3 enhanced security requirements. - Develop and test full operational capability of the CMMC Enterprise Mission Assurance Support Service (Emass) database execute periodic releases. 			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0606771D8Z / <i>Cyber Resiliency & Cyber security Policy</i>	Project (Number/Name) 145 / <i>Cyber Resiliency & Cybersecurity Policy</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
- Partner with the DIB sector to analyze and demonstrate promising and cost-effective capabilities and candidate solutions related to supply chain risk management and DIB cybersecurity <i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> There is no significant change between FY 2022 and FY 2023			
Accomplishments/Planned Programs Subtotals		-	31.460
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support	R-1 Program Element (Number/Name) PE 0203345D8Z / Defense Operations Security Initiative (DOSI)
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	7.775	2.985	2.925	3.034	-	3.034	3.112	3.177	3.194	3.258	Continuing	Continuing
345: Defense Operations Security Initiative	7.775	2.985	2.925	3.034	-	3.034	3.112	3.177	3.194	3.258	Continuing	Continuing

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 003

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression, Defend the Homeland, and Build Sustainable and Long-Term Advantage.

The Defense Operations Security Initiative (DOSI) establishes and leads the Department's next generation Operations Security (OPSEC) capability development and affiliated investment strategy. Investments support DoD's current and emerging OPSEC capability gaps, including countering advances in non-U.S. Intelligence, Surveillance, and Reconnaissance (ISR) capabilities and denying the understanding of U.S. capability, capacity, readiness and critical technology and information from adversaries. These investments spur Department innovation and preserve U.S. technology superiority. DOSI analysis and engineering lead the community's ability to sustain and maximize technology advantage as they are transitioned to Service and Agency programs for sustainment, maintenance, and capacity programming. Test and evaluation analyses establish measure and countermeasure effectiveness in current and emerging operational environments.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	3.099	2.925	0.000	-	0.000
Current President's Budget	2.985	2.925	3.034	-	3.034
Total Adjustments	-0.114	0.000	3.034	-	3.034
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.114	-			
• Adjustment to Budget Year	-	-	3.034	-	3.034

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support		R-1 Program Element (Number/Name) PE 0203345D8Z / Defense Operations Security Initiative (DOSI)
<div>Change Summary Explanation</div> <div>FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.</div>		

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0203345D8Z / Defense Operations Security Initiative (DOSI)				Project (Number/Name) 345 / Defense Operations Security Initiative			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
345: Defense Operations Security Initiative	7.775	2.985	2.925	3.034	-	3.034	3.112	3.177	3.194	3.258	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 003												
A. Mission Description and Budget Item Justification												
DOSI establishes and leads the Department's next generation Operations Security (OPSEC) capability development and affiliated investment strategy. Investments support DoD's current and emerging OPSEC capability gaps, including countering advances in non-U.S. Intelligence, Surveillance, and Reconnaissance (ISR) capabilities and denying the understanding of U.S. capability, capacity, readiness and critical technology and information from adversaries. These investments spur Department innovation and preserve U.S. technology superiority. DOSI analyses and engineering activities lead the community's ability to sustain and maximize technology advantages as they are transitioned to Service and Agency programs for sustainment, maintenance, and capacity programming. Results of tests and evaluations enable the community to identify OPSEC measure and countermeasure effectiveness in current and emerging operational environments.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: Defense Operations Security Initiative									2.985	2.925	3.034	
Description: RDT&E investments focused on countering advances in non-U.S. ISR capabilities and denying adversaries' understanding of U.S. capability, capacity, readiness, and critical technology and information. These investments spurred Department innovation towards preserving U.S. information and technology superiority. DOSI's analyses and engineering activities enabled the OPSEC community's ability to sustain and maximize technological advantages.												
FY 2022 Plans:												
- Oversee research, development, and testing on next generation capabilities that counter foreign ISR capabilities and deny adversaries' understanding of U.S. capability, capacity and readiness.												
- Provide oversight and advocacy for transitioning developed capabilities into formalized program offices and program executive offices across DoD Components.												
- Participate in Defense RDT&E processes to advance basic and applied research, science and technology, and technology development and testing to elevate OPSEC capability and capacity across the Department.												
FY 2023 Plans:												
- Continue to oversee research, development, and testing on next generation capabilities that counter foreign ISR capabilities and deny adversaries' understanding of U.S. capability, capacity and readiness.												
- Continue to provide oversight and advocacy for transitioning developed capabilities into formalized program offices and program executive offices across DoD Components.												

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0203345D8Z / <i>Defense Operations Security Initiative (DOSI)</i>	Project (Number/Name) 345 / <i>Defense Operations Security Initiative</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
- Continue to participate in Defense RDT&E processes to advance basic and applied research, science and technology, and technology development and testing to elevate OPSEC capability and capacity across the Department. <i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> No significant change.			
Accomplishments/Planned Programs Subtotals		2.985	2.925
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
The acquisition, management, and contracting strategy involves the following: <ul style="list-style-type: none"> • Adhere to guidance outlined in DoD 5000, Directive 7, Federal Acquisition Regulations (FAR), and FAR Supplement Policies and Procedures. • RDT&E OPSEC capabilities, systems, tools, products, and services through a disciplined, yet agile, process that ensures signature management and signature obfuscation capabilities are available for DoD components. • Sustain an acquisition process that is responsive and responsible to internal and external customers and stakeholders. • Continue to support the warfighter's need for capabilities that dominate today's dynamic, networked battlespace by providing strategy across the DoD for the planning and execution of OPSEC. 			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support	R-1 Program Element (Number/Name) PE 0303260D8Z / Defense Military Deception Program Office (DMDPO)
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	0.982	0.984	0.850	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.816
891: Defense Military Deception Program	0.982	0.984	0.850	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.816
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression, Defend the Homeland, and Build Sustainable and Long-Term Advantage.

The Sensitive Messaging and Operations in the Information Environment (SM&OIE) RDT&E program, which was repurposed out of the prior Defense Military Deception Program Office, brings value to the Defense Intelligence Enterprise by investing in new ideas and technologies to support growing Department-wide SM&OIE activities. The SM&OIE RDT&E program enhances acquisition and mission execution by helping transition new technologies, fund studies, conduct analyses of alternatives, develop product improvement efforts, and provide funding for SM&OIE innovation efforts. The program pursues projects that provide incremental improvements as well as those with the greatest potential to strategically transform DoD SM&OIE, with a primary focus on closing capabilities gaps. Program supports growing interest in SM&OIE from the Executive Office of the President, Congress, the National Security Council, and the National Intelligence Council.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	1.014	0.969	0.000	0.000	0.000
Current President's Budget	0.984	0.850	0.000	0.000	0.000
Total Adjustments	-0.030	-0.119	0.000	0.000	0.000
• Congressional General Reductions	-	-0.119			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.030	-			

Change Summary Explanation

Funds were transferred to Operations & Maintenance for sustainment tasks.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022			
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 6: RDT&E Management Support		R-1 Program Element (Number/Name) PE 0303260D8Z I Defense Military Deception Program Office (DMDPO)				
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Title: Defense Military Deception Program Office		0.984	0.850	0.000	0.000	0.000
Description: The Sensitive Messaging and Operations in the Information Environment (SM&OIE) RDT&E program, repurposed out of the prior Defense Military Deception Program Office, brings value to the Defense Intelligence Enterprise by investing in new ideas and technologies to support growing Department-wide SM&OIE activities. The SM&OIE RDT&E program enhances acquisition and mission execution by helping transition new technologies, fund studies, conduct analyses of alternatives, develop product improvement efforts, and provide funding for SM&OIE innovation efforts. The program pursues projects that provide incremental improvements as well as those with the greatest potential to strategically transform DoD SM&OIE, with a primary focus on closing capabilities gaps. Program supports growing interest in SM&OIE from the Executive Office of the President, Congress, the National Security Council, and the National Intelligence Council.						
FY 2022 Plans: - Continue to oversee research, development and testing programs related to Sensitive Messaging affiliated with current CCMD and Service requirements. - Continue to provide oversight and advocacy for transitioning developed capabilities into formalized program offices and program executive offices across DoD Components. - Continue to participate in Defense RDT&E processes to advance basic and applied research, science and technology, and technology development and testing to elevate Sensitive Messaging and Operations in the Information Environment capability and capacity across the Department. - Continue to provide technical subject matter expertise to integrate Sensitive Messaging core concepts into SECDEF-directed program that, among other things, directs the OSD to research, develop, and evaluate novel ways to utilize Sensitive Messaging, Deception, Influence, and other Operations in the Information Environment.						
FY 2023 Base Plans: N/A						
FY 2023 OCO Plans: N/A						
FY 2022 to FY 2023 Increase/Decrease Statement: Funds moved to O&M for operational requirements.						
Accomplishments/Planned Programs Subtotals		0.984	0.850	0.000	0.000	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0303260D8Z I <i>Defense Military Deception Program Office (DMDPO)</i>
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D. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0303260D8Z O&M DW: <i>Defense Military Deception Program Office</i>	0.725	0.736	0.792	-	0.792	0.813	0.837	0.863	0.880	Continuing	Continuing

Remarks

E. Acquisition Strategy

The acquisition, management, and contracting strategy involves the following:

- Adhere to guidance outlined in DoD 5000, Directive 7, Federal Acquisition Regulations (FAR), and FAR Supplement Policies and Procedures.
- Acquire and sustain SM&OIE capabilities, systems, tools, products, and services through a disciplined, yet agile, process that ensures information related capabilities are available for DoD components.
- Sustain an acquisition process that is responsive and responsible to internal and external customers and stakeholders.
- Continue to support the warfighter's need for capabilities that dominate today's dynamic, networked battlespace by providing governance, oversight, and strategy across the DoD for the planning and execution of SM&OIE activities.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 7: Operational Systems Development</i>	PE 0607210D8Z / <i>Industrial Base Analysis and Sustainment Support</i>											
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	227.903	170.207	335.410	588.094	-	588.094	636.406	683.702	523.038	286.036	-	-
819: <i>Industrial Base Analysis and Sustainment</i>	227.903	166.457	327.410	588.094	-	588.094	636.406	683.702	523.038	286.036	-	-
821: <i>Microelectronics</i>	-	3.750	8.000	-	-	-	-	-	-	-	-	-

Note

New Start (Y/N): Y

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Defend the Homeland, Build Sustainable and Long-Term Advantage, and Taking Care of People.

Industrial Base Analysis and Sustainment (IBAS) Support was established in accordance with 10 USC Sec 2508 Industrial Base Fund. The ability of the United States to maintain readiness, and to surge and sustain in response to an emergency, directly relates to the capacity, capabilities, and resiliency of our manufacturing and defense industrial base and supply chains. IBAS authorities and flexibility are key components to build the industrial capabilities needed to innovate, produce, and sustain the weapon systems for today and tomorrow.

The IBAS Program provides the Department with a unique capability to achieve the strategic aims of the 2022 National Defense Strategy, which calls for a strong, resilient, responsive and healthy U.S. Industrial Base (IB) that underpins current and future U.S. force readiness. This program is uniquely positioned to improve the U.S. Industrial Base's competitiveness and ability to respond to the Department's needs by applying focused investments to 1) monitor and assess the current state of the IB, 2) address critical issues in the IB relating to urgent operational needs, 3) address supply chain vulnerabilities, and 4) support efforts to expand the Industrial Base.

The IBAS program is one component of a broader integrated DoD investment strategy to build and strengthen the defense industrial base and secure U.S. supply chains. IBAS investments are used discretely and in tandem with other DoD investment programs to achieve DoD and national security goals.

Global supply chain disruptions have become more common, with recent events highlighting risks and vulnerabilities that undermine our national security. The February 24, 2022 report on Executive Order (E.O.) 14017, "America's Supply Chains", and the 2022 Industrial Base Capabilities (ICR) report, each outline strategic focus areas and enabling capabilities, their associated vulnerabilities, and provide recommendations to strengthen the defense industrial base.

The FY 2023 IBAS budget reflects the DoD's commitment to ensuring our supply chains can provide our warfighters with decisive advantage. This budget includes investments to respond to E.O. 14017 and ICR findings and recommendations, emerging and modernization priorities and technologies, and other defense requirements. This is the result of significant coordination for each strategic focus area via cross-functional teams (CFT). These CFTs developed an integrated and prioritized investment strategy to address the most pressing needs for each focus area, to include mapping to investment authorities. The FY 2023 IBAS budget reflects the outcome of the CFT recommendations, and has been coordinated to complement adjacent investments of related programs including the Defense Production Act

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0607210D8Z <i>I Industrial Base Analysis and Sustainment Support</i>
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(DPA) Title III, Manufacturing Technology (ManTech) program, and at the Military Service level. Accordingly, investments in the strategic focus areas addressed below will establish, sustain, and expand domestic capabilities and capacities to build more viable and resilient supply chains.

Management Process – To successfully execute the FY 2023 budget, the IBAS Program Office within the Office of the Assistant Secretary of Defense Industrial Base Policy (OASD(IBP)) will oversee the health of the IBAS portfolio and project codes. The IBAS Program Office coordinates with a Military Service or defense agency technical lead to develop and execute an acquisition strategy and implementation plans for each strategic focus area.

FY 2023 strategic focus areas that will be executed in IBAS Project Code P819 include workforce, critical materials and chemicals, castings and forgings, kinetic weapons, energy storage and batteries, biomanufacturing, and microelectronics. Descriptions of each focus area are included in the P819 R-2a.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	172.145	58.189	0.000	-	0.000
Current President's Budget	170.207	335.410	588.094	-	588.094
Total Adjustments	-1.938	277.221	588.094	-	588.094
• Congressional General Reductions	-	-0.329			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	277.550			
• Congressional Directed Transfers	-	-			
• Reprogrammings	3.750	-			
• SBIR/STTR Transfer	-5.688	-			
• Adjustments to Budget Year	-	-	587.485	-	587.485
• Economic Assumptions	-	-	0.609	-	0.609

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 819: *Industrial Base Analysis and Sustainment*

Congressional Add: *Program Increase*

Congressional Add: *Active Matrix Organic Light Emitting Diode*

Congressional Add: *Advanced Armor Piercing Penetrator/ Risk Reduction for Tungsten Defense Products*

Congressional Add: *Advanced Manufacturing Workforce Development*

Congressional Add: *Advanced Nanomaterials Manufacturing / Metal-organic frameworks*

Congressional Add: *Automated textile manufacturing*

Congressional Add: *Industrial Skills*

FY 2021	FY 2022
9.646	10.000
5.000	-
5.000	-
6.000	-
10.000	7.500
10.000	10.000
3.500	10.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0607210D8Z <i>I Industrial Base Analysis and Sustainment Support</i>	
Congressional Add Details (\$ in Millions, and Includes General Reductions)		FY 2021	FY 2022
Congressional Add: <i>Interdisciplinary Center for Advanced Manufacturing Systems</i>		7.500	10.000
Congressional Add: <i>Freeze Dried Plasma</i>		10.000	10.000
Congressional Add: <i>Frequency Selective Limiters</i>		5.000	-
Congressional Add: <i>Lead-free Electronics</i>		10.000	7.500
Congressional Add: <i>Machine Tooling and Advanced Manufacturing</i>		20.000	20.000
Congressional Add: <i>Munitions Supply Chain Expansion</i>		2.000	-
Congressional Add: <i>Pilot Mask Technology</i>		10.000	5.000
Congressional Add: <i>Precision Optics Manufacturing</i>		4.000	4.000
Congressional Add: <i>Shape Memory Alloys (SMA)</i>		5.000	-
Congressional Add: <i>Submarine Workforce Development</i>		20.000	20.000
Congressional Add: <i>High Performance Weldable Armor</i>		5.000	-
Congressional Add: <i>Weldable Ultra Hard Armor</i>		10.000	3.000
Congressional Add: <i>Accelerated training in defense manufacturing</i>		-	5.000
Congressional Add: <i>Advanced Headborne Systems Manufacturing</i>		-	7.500
Congressional Add: <i>Carbon/carbon Industrial Base Enhancement</i>		-	6.000
Congressional Add: <i>Career and Technical Education Pilot</i>		-	10.000
Congressional Add: <i>Defense Supply Chain Enhancement</i>		-	10.000
Congressional Add: <i>Digital Engineering Enabled Workforce Development</i>		-	7.000
Congressional Add: <i>Digital Thread Manufacturing Demonstration</i>		-	8.000
Congressional Add: <i>Enhanced Digital Capabilities</i>		-	7.000
Congressional Add: <i>Heavy Rare Earth Elements Program</i>		-	80.000
Congressional Add: <i>Rare Earth Elements and Critical Minerals Recovery Technique Demonstration</i>		-	3.000
Congressional Add: <i>Rare Earth Separation Technologies</i>		-	4.000
Congressional Add: <i>Resilient Manufacturing Ecosystem</i>		-	2.500
Congressional Add: <i>Ruggedized Transceivers</i>		-	10.000
Congressional Add: <i>Systems Engineering Technician Education Initiative</i>		-	0.550

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0607210D8Z <i>I Industrial Base Analysis and Sustainment Support</i>	
Congressional Add Details (\$ in Millions, and Includes General Reductions)		FY 2021	FY 2022
Congressional Add Subtotals for Project: 819		157.646	277.550
Congressional Add Totals for all Projects		157.646	277.550
<u>Change Summary Explanation</u> FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding. FY 2023 Adjustments to Budget Years reflects amount not included in the FY 2022 President's Budget request, and internal realignment of funds for DoD priorities, including the following: workforce initiatives, critical materials and chemicals, castings and forgings, kinetic weapons, energy storage and batteries, biomanufacturing, and microelectronics ecosystem. P821 Microelectronics FY 2023 funding for the Defense Microelectronics Cross-Function Team effort transitions from Program Element 0607210D8 to Program Element 0604294D8Z Microelectronics under the Office of the Undersecretary of Defense for Research and Engineering (OUSD(R&E)).			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 7					R-1 Program Element (Number/Name) PE 0607210D8Z / Industrial Base Analysis and Sustainment Support				Project (Number/Name) 819 / Industrial Base Analysis and Sustainment			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
819: Industrial Base Analysis and Sustainment	227.903	166.457	327.410	588.094	-	588.094	636.406	683.702	523.038	286.036	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Global supply chain disruptions have become more common, with recent events highlighting risks and vulnerabilities that undermine our national security. The February 24, 2022 report on Executive Order (E.O.) 14017, “America’s Supply Chains”, and the 2022 Industrial Base Capabilities (ICR) report each outline strategic focus areas and enabling capabilities, their associated vulnerabilities, and provide recommendations to strengthen the defense industrial base.

The FY 2023 IBAS budget reflects the DoD’s commitment to ensuring our supply chains can provide our warfighters with decisive advantage. This budget includes investments to respond to E.O. 14017 and ICR findings and recommendations, emerging and modernization priorities and technologies, and other defense requirements. This is the result of significant coordination for each strategic focus area via cross-functional teams (CFT). These CFTs developed an integrated and prioritized investment strategy to address the most pressing needs for each focus area, to include mapping to investment authorities. The FY 2023 IBAS budget reflects the outcome of the CFT recommendations and has been coordinated to complement adjacent investments of related programs including the Defense Production Act (DPA) Title III, Manufacturing Technology (ManTech) program, and at the Military Service level. Accordingly, investments in the following strategic focus areas will establish, sustain, and expand domestic capabilities and capacities to build more sustainable and resilient supply chains.

Workforce – the DoD relies on a skilled workforce to innovate, produce, and sustain our weapon systems. Decades of erosion across workforce development pipelines jeopardize and threaten our industrial base’s ability to remain competitive. Efforts will continue to focus on recruitment, training, and placing skilled workers in support of defense priority states and in support of priority defense programs. FY 2023’s primary effort will be a major, multi-year, joint OSD-Navy endeavor focused on ensuring the health and capacity of the DoD’s submarine workforce.

Critical Materials and Chemicals - critical materials and critical chemicals are used in a broad range of DoD weapon systems. Like other industrial sectors such as microelectronics, there is a critical materials market concentration in China which makes U.S. economic and national security vulnerable to disruption. To mitigate risks, the DoD will pursue four lines of effort: 1) Develop and foster new sustainability standards for strategic and critical material intensive industries; 2) Expand sustainable domestic production and processing capacity, including non-traditional mining and recycling; 3) Strengthen U.S. stockpiles; 4) Work with allies and partner nations promoting sharing of technology, capability, and resources. FY 2023 primary efforts will continue prior year initiatives related to scaling domestic processing of Heavy Rare Earth Elements (HREE).

Kinetic Weapons – kinetic capabilities, including hypersonic weapons, are essential to deterring America’s adversaries, who continue their military buildups including their own hypersonics capability. Current supply chains are vulnerable to raw materials and chemicals shortages; fragile, foreign, and/or sole-source suppliers; and technical challenges of transitioning hypersonic capabilities into production. The DoD will launch efforts to: 1) Address supply chain vulnerabilities of the most critical

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607210D8Z / <i>Industrial Base Analysis and Sustainment Support</i>	Project (Number/Name) 819 / <i>Industrial Base Analysis and Sustainment</i>
chemicals; 2) Update material specifications, including production and quality testing requirements; and 3) Foster sub-tier suppliers and competition in the hypersonic industrial base to enable affordable production. FY 2023 primary focus efforts will improve and expand the hypersonics industrial base.		
Energy Storage and Batteries – Due to the small DoD market share and customized battery requirements the DoD is unable to fully leverage the large commercial investment in state of the art energy storage technology. The nearly 100% foreign battery supply chain limits the DoD’s ability to field battery enabled weapons/platforms free of adversary supply chain control. To mitigate these risks, DoD is investing to develop domestic assured access to batteries through three focus areas: 1) Initiate studies to define the aggregate demand for energy storage and batteries across the DoD; 2) Pivot to commercial standards and batteries to the maximum extent possible; and 3) Establish internal DoD safety testing capacity for energy storage and batteries for future weapons systems. FY 2023 primary efforts will initiate deep dive DoD demand analysis and identify commercial sourcing synergies.		
Castings and Forgings – machine tools and cast and forged parts are critical to the development, procurement, and sustainment of all major defense systems, and are found in 20 percent of the products representing the U.S. Gross Domestic Product. Continuous industry consolidation and offshoring since the 1960’s have hollowed out domestic capability, reducing or eliminating competition and increasing our dependence on other nations, including China. To mitigate these risks, the DoD will: 1) Continue refinement of a cross-service casting and forging strategy to inform policy and investment decisions; 2) Conduct research activities to expand sub-tier supplier development and, to improve rapid designs and affordable and reliable production; and 3) Invest to modernize relevant organic industrial base capabilities. FY 2023 primary investments will initiate deep dive analysis to inform strategic investment strategies.		
Flexible Biomanufacturing – biotechnology has the potential to transform the future battlefield and address key global challenges, but DoD lacks the domestic sourcing and production capabilities to rapidly manufacture critical bioproducts at industrial scale for operational use. The DoD has already taken measures to address some key gaps in the biomanufacturing pipeline, including the standup up of BioMADE, the Manufacturing Innovation Institute dedicated to fostering technological innovation in synthetic biology-enabled manufacturing from design to the manufacturing of non-medical products. Key challenges remain in the scale-up of domestic manufacturing capacity and the market-driven rigidity of existing biomanufacturing processes. To overcome these challenges, the DoD created the Distributed Manufacturing Enabled by Modular Bioindustrial & Reusable Assets (MEMBR). MEMBR is a bioindustrial manufacturing infrastructure investment program to pilot and commercially scale DoD molecules. MEMBR has begun investments to: 1) Increase industrial capacity by converting and modernizing existing production facilities and creating new ones; 2) Adopt modular biomanufacturing capabilities that are able to rapidly use and evaluate the efficacy of new processes; 3) Provide education and workforce development opportunities; and 4) Identify and foster integration of commercial bioindustrial products and precursors into DoD acquisition pathways. FY 2023 primary efforts will initiate modernization and adaptation of three existing production facilities to accommodate DoD requirements.		
Microelectronics - components are the foundation of modern economy and military systems. Various vulnerabilities threaten the DoD’s ability to source microelectronics needed to sustain programs of record. In order to prepare the Department for increased global economic and strategic, the DoD must take action to ensure access to the microelectronic components needed to sustain our defense programs and systems effectively and affordably. The Department also needs a better strategy to transition leading edge technology developed by both government and industry to DoD programs of record, to ensure the Department maintains a competitive edge. To respond to the threat and establish a secure and assured domestic supply chain, the DoD will pursue multiple lines of microelectronics efforts. Efforts included in IBAS are 1) Establishing domestic advanced packaging capabilities; 2) Establishing data repository to manage obsolescence; and 3) Establishing workforce efforts needed to design and make microelectronic components domestically.		

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022	
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607210D8Z / Industrial Base Analysis and Sustainment Support	Project (Number/Name) 819 / Industrial Base Analysis and Sustainment		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Title: Industrial Base Analysis and Sustainment (IBAS) Support		8.811	49.860	588.094
Description: IBAS currently focuses efforts and investments for all fiscal years in the categories listed below, continuing investments to mitigate supply chain risks and findings from Executive Order 14017, and on-going assessments for both traditional defense sectors and cross-cutting sectors.				
FY 2022 Plans:				
1. Workforce				
Industrial Skills Development and Acceleration - The National Imperative for Industrial Skills (NIIS) initiative developed additional momentum in FY 2022 across the Workforce objectives described in R-2a section A above, capping a third straight year of upward investment growth with continued supportive congressional interest. Accomplishments across the initiative's 12 ongoing investment projects are detailed in the department's 160-page report entitled "Training of Skilled Technicians for the Defense Industrial Base: Pilot Program Strategy," delivered to the Senate Armed Services Committee in FY 2022. Also in FY 2022, a 13th NIIS project was awarded to establish a "High Velocity Training Center" supporting organic industrial workforce training needs of the U.S. Army Aviation and Missile Command located at Redstone Arsenal, Alabama. The project highlights the use of mobile, 'fleet-in' capabilities to address unmet demand in DoD's aerospace/aviation and manufacturing, logistics and distribution sectors. Training will certify and upskill existing employees; expand recruitment, particularly for underserved communities; and partner with local community colleges for follow-on learning after certification. New training certifications will be established for organic industrial base (OIB) needs including electricians, metrologists, armament welders, and others. The program will establish a 2-shift per training cohort schedule to certify 500 new technicians per year.				
Workforce Strategy – the IBAS office spearheaded the establishment of a joint OUSD(A&S)- OUSD(R&E) led team, overseen by the department's Industrial Base Council, to develop the first-ever "DoD Defense Industrial Base Workforce Strategic Plan." The strategy describes how shifts in the landscape of the industrial and innovation workforce ecosystems of the nation have driven the DoD to recalibrate its traditional federal roles and responsibilities in this space. It positions the DoD to be more systematic, forward-leaning and participatory in addressing defense industrial base workforce risks and health. Similarly, the strategy encourages new public-private partnerships and adjusted risk-sharing arrangements.				
2. Critical Chemicals and Minerals				
Rare Earth Elements – Continued efforts to establish, sustain, and improve value-added manufacturing domestic rare earth capabilities and commercialize products. Primary focus is centered on the design and build of two complimentary HREE separation and processing lines in support of the DoD's efforts to address supply chain risks associated with the dependence on rare earth elements from foreign non-allied countries.				
FY 2023 Plans:				

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 7		R-1 Program Element (Number/Name) PE 0607210D8Z / <i>Industrial Base Analysis and Sustainment Support</i>		Project (Number/Name) 819 / <i>Industrial Base Analysis and Sustainment</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
<p>1. Workforce Industrial Skills Development and Acceleration (National Imperative for Industrial Skills (NIIS) initiative: FY 2023 continues and expands NIIS multiyear efforts initiated in prior years, as addressed in the Workforce narrative in Section A, and in FY 2022 Accomplishments above. All 13 funded projects in the NIIS portfolio continue in FY 2023 at various planned programmatic stages, iteratively testing, validating and refining multiple elements or segments of the initiative's 'Industrial Skills Workforce Development Ecosystem Model. The intent is to produce increasing levels of real world system maturity, harmonization/integration and effectiveness as depicted in the model. For example, in FY 2023, the High Velocity Training Center project will shift from Phase 0 start-up activities into full-scale student training and workforce delivery to the OIB.</p> <p>Submarine Workforce: The most significant change to the National Imperative for Industrial Skills initiative FY 2023 portfolio is the introduction of a major, multi-year joint OSD-Navy endeavor focused on ensuring the health and capacity of the DoD's Submarine Industrial Base. IBAS, in partnership with the Navy submarine enterprise, will continue to invest in the industrial base's development of the necessary training and education programs. The objective is to accelerate the path to establishing at-scale regional training centers and other workforce pipeline delivery modes as needed to create sufficient capability to provide "ready to work" high skill technical tradespeople at the production levels needed to meet the nuclear Navy's submarine modernization requirements. Efforts will initially focus on seven priority states where key suppliers reside.</p> <p>Divestiture Pilot: To respond to new threats, the DoD needs to divest from old programs and build new capabilities. While necessary, divesting often creates long downtimes within the supply chain prior to the start of new work. These production gaps risk permanent loss of workers and capability needed to produce new programs. This effort will pilot regional projects to minimize program divestiture impacts. Efforts include 1) retrain and retain workforce for future production requirements, e.g. shift from aluminum to steel welding; and 2) capitalize and qualify as new suppliers for other programs. Initial efforts will focus on transition from aluminum construction to supporting Program Executive Office Strategic Submarines' Columbia Class Program and Program Executive Office Attack Submarines' Virginia Class Program.</p>					
<p>2. Critical Chemicals and Materials Sector: Heavy Rare Earth: continue efforts to establish, sustain, and improve value-added manufacturing domestic rare earth capabilities and commercialize products. Continue the design and build of two domestic HREE processing lines in support of the DoD's efforts to address supply chain risks associated with the dependence on rare earth elements from foreign non-allied countries.</p> <p>Other Material Sectors – expand, sustain, and improve the value-added domestic manufacturing capabilities for critical materials such as boron and carbon fibers, magnesium, and tantalum for defense applications.</p>					

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Appropriation/Budget Activity 0400 / 7		R-1 Program Element (Number/Name) PE 0607210D8Z / <i>Industrial Base Analysis and Sustainment Support</i>		Project (Number/Name) 819 / <i>Industrial Base Analysis and Sustainment</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Chemical Energetics: launch efforts to sustain and expand domestic capacities for priority chemicals in support of the DoD's energetics and munitions supply chain.					
3. Castings and Forgings and Machine Tools Castings and Forgings Analysis: execute a comprehensive assessment of the casting and forging sector with emphasis on comparing DoD demand with industry capabilities. The results of this assessment inform ongoing development and refinement of a cross-Service casting and forging strategy to inform policy and investment decisions.					
4. Energy Storage and Batteries: initiate a series of studies to assess and analyze 1) DoD consumption and purchasing patterns; 2) domestic commercial sources of supply and their capability and capacity to support DoD needs; and 3) domestic testing facilities and capabilities for future acquisition requirements.					
5. Kinetic Weapons Hypersonics: industrial base projects to improve manufacturing and expand capacity for hypersonics programs in coordination with other OSD and Military Service organizations. Efforts will increase capacity of existing suppliers, establish second sources, and address workforce challenges.					
6. Emerging Technology Flexible Biomanufacturing: investments to support the expansion of the domestic bioindustrial manufacturing base to include flexible and modular production assets to deliver critical biomaterials and precursors at necessary scale to support DoD operational needs. Initiate: three flexible industrial scale facilities for an estimated five DoD-relevant molecules; five to six new-build flexible pilot scale facilities to rapidly prototype, test, and evaluate an estimated 20 additional molecules relevant to DoD and the bioeconomy; and one first-of-its-kind, domestic, modular biomanufacturing center to enable prototyping and some commercial-scale production of an estimated five DoD-relevant molecules and rapid configuration to advance process optimization and deployable capabilities.					
7. Microelectronics To respond to the threat and establish a secure and assured domestic supply chain, the DoD will pursue multiple lines of microelectronics efforts. Efforts include 1) Establishing domestic advanced packaging capabilities; 2) Establishing data repository to manage obsolescence; and 3) Establishing workforce efforts needed to design and make microelectronic components domestically.					
FY 2023 efforts will focus on:					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022		
Appropriation/Budget Activity 0400 / 7		R-1 Program Element (Number/Name) PE 0607210D8Z / <i>Industrial Base Analysis and Sustainment Support</i>		Project (Number/Name) 819 / <i>Industrial Base Analysis and Sustainment</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2021	FY 2022	FY 2023
Microelectronics Secure Packaging: Packaging is a critical stage of the microelectronics supply chain of DoD systems from both a functionality and a security perspective. Packaging finalizes the contents and therefore the integrity of the device. An ever increasing amount of the Size, Weight, Power and Cost (SWAP-C) improvements realized at the system level are now achieved through packaging technology advancements. IBAS will continue efforts to establish a state-of-the-art on-shore secure packaging ecosystem, develop security solutions, and develop technology demonstrators needed for transition.					
Enterprise Electronic Parts Management System (EEPMS): EEPMS is a DoD-wide microelectronics parts management tool utilized at the program office level, enabling insight into supply chains and lifecycle management of microelectronics enterprise wide. This capability will grant visibility into the supply chain, enable better supply chain risk management, allow aggregation of demand, improve purchasing power, enable collaborative solutions to obsolescence and other parts related issues, reduce the risk of counterfeit parts, and enable more DoD wide design modernization.					
FY 2022 to FY 2023 Increase/Decrease Statement: P819 IBAS Baseline net increase of \$538 million includes: reduction for the one-time FY 2022 increase of \$41.000 for Heavy Rare Earth Elements; FY 2023 increases totaling \$497 million reflecting OSD internal realignment of funds for DoD priorities, including the following. Workforce initiatives, Defense Advanced Battery Supply Chain, Castings and Forgings Supply Chain, Critical Chemicals, Hypersonic Weapons Components; Distributed Manufacturing Enabled by Modular Bioindustrial and Reusable Assets; and Microelectronics efforts.					
Accomplishments/Planned Programs Subtotals			8.811	49.860	588.094
			FY 2021	FY 2022	
Congressional Add: Program Increase			9.646	10.000	
FY 2021 Accomplishments: Apply to supply chain analysis in multiple sectors including supply chain resiliency, and additional workforce development efforts. Offset to SBIR/STTR taxes applicable to Congressional Add total of \$163.000 was \$5,354					
FY 2022 Plans: Apply to supply chain analysis in multiple sectors including supply chain resiliency, and additional workforce development efforts. Possible partial offset to SBIR/STTR taxes applicable to Congressional Add totals.					
Congressional Add: Active Matrix Organic Light Emitting Diode			5.000	-	
FY 2021 Accomplishments: Sole Source - Improve and stabilize the single domestic source of organic light emitting diode manufacturing which supports numerous DoD combat platforms.					
Congressional Add: Advanced Armor Piercing Penetrator/ Risk Reduction for Tungsten Defense Products			5.000	-	

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607210D8Z / <i>Industrial Base Analysis and Sustainment Support</i>	Project (Number/Name) 819 / <i>Industrial Base Analysis and Sustainment</i>	
		FY 2021	FY 2022
FY 2021 Accomplishments: This initiative enhanced and optimized the manufacturing process of a tungsten carbide component while simultaneously increasing the capacity of parts per year to meet the Army's minimum forecasted requirements.			
Congressional Add: Advanced Manufacturing Workforce Development		6.000	-
FY 2021 Accomplishments: National Imperative for Industrial Skills (NIIS) - Accelerate production of skilled technicians to address knowledge and skills gaps in metals additive manufacturing and its use to enable more innovative product design and production.			
Congressional Add: Advanced Nanomaterials Manufacturing / Metal-organic frameworks		10.000	7.500
FY 2021 Accomplishments: Expand Supply Chain - No domestic capability exists for mature metal organic frameworks compound to meet soldier chemical, biological, radiological, and nuclear filter requirements. Funds will establish domestic capability for to incorporate into M61 filters.			
FY 2022 Plans: Expand Supply Chain - No domestic capability exists for mature metal organic frameworks compound to meet soldier chemical, biological, radiological, and nuclear filter requirements. Funds will establish domestic capability for to incorporate into M61 filters.			
Congressional Add: Automated textile manufacturing		10.000	10.000
FY 2021 Accomplishments: Established partnership to prototype and implement automated manufacturing processes for advanced textiles needed for defense use and develop associated workforce curricula and training programs needed for successful industry adoption and use.			
FY 2022 Plans: Established partnership to prototype and implement automated manufacturing processes for advanced textiles needed for defense use and develop associated workforce curricula and training programs needed for successful industry adoption and use.			
Congressional Add: Industrial Skills		3.500	10.000
FY 2021 Accomplishments: National Imperative for Industrial Skills (NIIS) - Assess requirements, expand recruitment, expand and accelerate training in key sectors as needed.			
FY 2022 Plans: National Imperative for Industrial Skills (NIIS) - Assess requirements, expand recruitment, expand and accelerate training in key sectors as needed.			
Congressional Add: Interdisciplinary Center for Advanced Manufacturing Systems		7.500	10.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607210D8Z / <i>Industrial Base Analysis and Sustainment Support</i>	Project (Number/Name) 819 / <i>Industrial Base Analysis and Sustainment</i>	
		FY 2021	FY 2022
FY 2021 Accomplishments: Lower the barriers for entry to small and medium manufacturers to adopt manufacturing capabilities including 5-axis, additive, digital and Internet of Things (IOT) 4.0 capabilities			
FY 2022 Plans: Lower the barriers for entry to small and medium manufacturers to adopt manufacturing capabilities including 5-axis, additive, digital and Internet of Things (IOT) 4.0 capabilities			
Congressional Add: Freeze Dried Plasma		10.000	10.000
FY 2021 Accomplishments: Freeze-dried medical products with greater longevity would increase the opportunity for injured warfighters operating in austere environments to receive transfusions sooner in the process. To optimize transfusion therapy on the battlefield far forward, additional development of manufacturing technology must be done to enable production of freeze-dried pathogen-inactivated plasma, cryoprecipitate, and cryo-depleted plasma, all of which can be used for immediate treatment of wounded service members at the point of injury.			
FY 2022 Plans: Freeze-dried medical products with greater longevity would increase the opportunity for injured warfighters operating in austere environments to receive transfusions sooner in the process. To optimize transfusion therapy on the battlefield far forward, additional development of manufacturing technology must be done to enable production of freeze-dried pathogen-inactivated plasma, cryoprecipitate, and cryo-depleted plasma, all of which can be used for immediate treatment of wounded service members at the point of injury.			
Congressional Add: Frequency Selective Limiters		5.000	-
FY 2021 Accomplishments: Expand Defense Industrial Base - Frequency Selective Limiters (FSL) are used to strengthen electronic warfare systems against electromagnetic interference attacks. Current production rates of the substrate Gadolinium Gallium Garnet (GGG) used to grow the Yttrium Iron Garnet films are insufficient to meet DoD requirements. Effort will significantly expand capacity to meet requirements.			
Congressional Add: Lead-free Electronics		10.000	7.500
FY 2021 Accomplishments: The 2006 European Union's restriction on using lead solder in electronics caused 99 percent of electronics suppliers to switch to tin-based solders for electronics circuit boards and assemblies. Tin-based solders are unable to withstand military operational requirements, resulting in reliability and performance deficiencies. This effort developed alternative solder alloys and delivered a solder performance specification, a DoD solder users' handbook, and an implementation roadmap that can accelerate the transition to lead-free electronics for defense systems.			
FY 2022 Plans: Tin-based solders are unable to withstand military operational requirements, resulting in reliability and performance deficiencies. This effort developed alternative solder alloys and delivered a solder			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607210D8Z / <i>Industrial Base Analysis and Sustainment Support</i>	Project (Number/Name) 819 / <i>Industrial Base Analysis and Sustainment</i>	
		FY 2021	FY 2022
performance specification, a DoD solder users' handbook, and an implementation roadmap that can accelerate the transition to lead-free electronics for defense systems.			
Congressional Add: Machine Tooling and Advanced Manufacturing FY 2021 Accomplishments: Machine Tools Component: Executive Order (EO) 13806 study results found critical and continuing erosions across the domestic machine tool industry. In response, this effort established a DoD partnership with Department of Energy (DoE) Oak Ridge National Lab (ORNL) called "America's Cutting Edge (ACE)." ACE applies the robust functional capacity of the Manufacturing Demonstration Facility (MDF) as a Hub for a public-private partnership that can leverage an existing \$1.5 billion DoE Research and Development (R&D) Partnership to restore U.S. machine tool prominence. Workforce Component: Accelerate workers into and through training and development pipelines to meet requirements. FY 2022 Plans: This effort established a DoD partnership with Department of Energy (DoE) Oak Ridge National Lab (ORNL) called "America's Cutting Edge (ACE)." ACE applies the robust functional capacity of the Manufacturing Demonstration Facility (MDF) as a Hub for a public-private partnership that can leverage an existing \$1.5 billion DoE Research and Development (R&D) Partnership to restore U.S. machine tool prominence. Workforce Component: Accelerate workers into and through training and development pipelines to meet requirements.		20.000	20.000
Congressional Add: Munitions Supply Chain Expansion FY 2021 Accomplishments: Establish Domestic Capability - support F35A 25mm round production to be moved from Switzerland to Camden, Arkansas.		2.000	-
Congressional Add: Pilot Mask Technology FY 2021 Accomplishments: Sustain life support supply chains for pilot masks - contracted due to limited investment for pilot masks and related technology. Today's aircraft have surpassed older, obsolete technology. FY 2022 Plans: Sustain life support supply chains for pilot masks - contracted due to limited investment for pilot masks and related technology. Today's aircraft have surpassed older, obsolete technology.		10.000	5.000
Congressional Add: Precision Optics Manufacturing		4.000	4.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607210D8Z / <i>Industrial Base Analysis and Sustainment Support</i>	Project (Number/Name) 819 / <i>Industrial Base Analysis and Sustainment</i>	
		FY 2021	FY 2022
FY 2021 Accomplishments: Precision Optics are used in almost every DoD platform but the collapse of the commercial optics community and decades of decreased DoD investment has endangered domestic capability for skilled workers and stable suppliers. Precision Optics Manufacturing provides a multi-prong approach to improve industrial base resilience and expands workforce development programs.			
FY 2022 Plans: Precision Optics are used in almost every DoD platform but the collapse of the commercial optics community and decades of decreased DoD investment has endangered domestic capability for skilled workers and stable suppliers. Precision Optics Manufacturing provides a multi-prong approach to improve industrial base resilience and expands workforce development programs.			
Congressional Add: Shape Memory Alloys (SMA) FY 2021 Accomplishments: Multi-year effort that builds on previous "America's Cutting Edge (ACE)." work in hybrid processes. Develop the materials and manufacturing processes to rapidly manufacture complex SMA geometries.		5.000	-
Congressional Add: Submarine Workforce Development FY 2021 Accomplishments: Public private partnership with states mitigating workforce shortfalls within the submarine supply chain. Established partnership to identify workforce needs through industry champions and senior executives who have decision-making authority and are passionate about the submarine industrial sector. FY 2022 Plans: Public private partnership with states mitigating workforce shortfalls within the submarine supply chain. Established partnership to identify workforce needs through industry champions and senior executives who have decision-making authority and are passionate about the submarine industrial sector.		20.000	20.000
Congressional Add: High Performance Weldable Armor FY 2021 Accomplishments: Expand ground vehicle light weight armor supply chain. Develop full-scale manufacturing process for producing an ultra-hard armor that is weldable.		5.000	-
Congressional Add: Weldable Ultra Hard Armor FY 2021 Accomplishments: Expand ground vehicle light weight armor supply chain. Develop full-scale manufacturing process for producing an ultra-hard armor that is weldable. FY 2022 Plans: Expand ground vehicle light weight armor supply chain. Develop full-scale manufacturing process for producing an ultra-hard armor that is weldable.		10.000	3.000
Congressional Add: Accelerated training in defense manufacturing		-	5.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607210D8Z / <i>Industrial Base Analysis and Sustainment Support</i>	Project (Number/Name) 819 / <i>Industrial Base Analysis and Sustainment</i>
	FY 2021	FY 2022
FY 2022 Plans: Improve the nation's capacity to produce and deliver workers with industrial skills to meet defense technology, acquisition, and operational needs through the demonstration of the potential of the ADTM training program that cuts training time up to 75 percent and can be the replicable model training program for a national network of regional training centers serving the Defense Industrial Base.		
Congressional Add: Advanced Headborne Systems Manufacturing FY 2022 Plans: Develop industrial base capability and capacity related to advanced headborne systems for military applications.	-	7.500
Congressional Add: Carbon/carbon Industrial Base Enhancement FY 2022 Plans: Development and expansion of the carbon-carbon manufacturing ecosystem for high temperature applications.	-	6.000
Congressional Add: Career and Technical Education Pilot FY 2022 Plans: Career and Technical Education Pilot	-	10.000
Congressional Add: Defense Supply Chain Enhancement FY 2022 Plans: Defense Supply Chain Enhancement	-	10.000
Congressional Add: Digital Engineering Enabled Workforce Development FY 2022 Plans: Develop and deploy digital engineering centric academic programs to support enhanced digital manufacturing skills and talent development for the defense industrial base.	-	7.000
Congressional Add: Digital Thread Manufacturing Demonstration FY 2022 Plans: Digital Thread Manufacturing Demonstration	-	8.000
Congressional Add: Enhanced Digital Capabilities FY 2022 Plans: Develop and deploy digital engineering centric academic programs to support enhanced digital manufacturing skills and talent development for the defense industrial base.	-	7.000
Congressional Add: Heavy Rare Earth Elements Program FY 2022 Plans: Efforts to establish, sustain, and improve value-added manufacturing domestic rare earth capabilities and commercialize products. Continue the design and build of two domestic HREE processing lines	-	80.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607210D8Z / <i>Industrial Base Analysis and Sustainment Support</i>	Project (Number/Name) 819 / <i>Industrial Base Analysis and Sustainment</i>	
		FY 2021	FY 2022
in support of the DoD's efforts to address supply chain risks associated with the dependence on rare earth elements from foreign non-allied countries.			
Congressional Add: Rare Earth Elements and Critical Minerals Recovery Technique Demonstration FY 2022 Plans: Development and demonstration of industrial scale processes related to recovering rare earth elements from mining byproducts.		-	3.000
Congressional Add: Rare Earth Separation Technologies FY 2022 Plans: Development and demonstration of industrial scale processes related to separating rare earth elements from raw ore and/or end products through recycling.		-	4.000
Congressional Add: Resilient Manufacturing Ecosystem FY 2022 Plans: Deployment of a micro-defense additive manufacturing ecosystem focused on transitioning materials, processes, equipment and people into a production environment.		-	2.500
Congressional Add: Ruggedized Transceivers FY 2022 Plans: Establish a reliable domestic supply chain for fiber optic transceivers capable of supporting current and future DoD program demands.		-	10.000
Congressional Add: Systems Engineering Technician Education Initiative FY 2022 Plans: Advance training in digital engineering and manufacturing methods and processes through the creation of a 2-year degree in Systems Engineering Technology.		-	0.550
Congressional Adds Subtotals		157.646	277.550
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
NA			
D. Acquisition Strategy			
NA			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 7						R-1 Program Element (Number/Name) PE 0607210D8Z / Industrial Base Analysis and Sustainment Support						Project (Number/Name) 819 / Industrial Base Analysis and Sustainment			
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
IBAS Baseline Program Efforts - Prior Years	C/Various	various : various	190.724	-		-		-		-		-	-	-	-
Workforce Initiatives	C/FFP	SE New Eng Def Ind Assoc; Senedia; Auburn Univ; TX A&M; Americom; RD Solutions; Inst Advanced Learning; VT Tech Coll; Aeromarc; IACMI; BG Workforce Solutions; 202 Group; Poplicus; Productive Res : Multiple States	-	47.028	Dec 2021	6.105	Mar 2022	234.737	Jun 2023	-		234.737	-	-	-
Heavy Rare Earth Elements Supply Chain Resiliency	C/FFP	MP Mine Operations LLC; other TBD : CA	5.363	-		41.000	Jun 2022	-		-		-	-	-	-
Technical Initiatives Awarded (excluding HREE)	C/FFP	Systems Innovation; Ultra-Met; Next Def Solutions; Partnership Assured Electronics; Nat Security Tech Accel; Global Tungsten : Multiple States	-	32.446	Dec 2021	-		-		-		-	-	-	-
Technical Issues - pending award (excluding HREE)	C/FFP	TBD : TBD	-	47.059	Jun 2022	-		344.328	Jun 2023	-		344.328	-	-	-
Advanced Machine Tools (ACE)	FFRDC	Oakridge National Laboratories : Oakridge, TN	13.693	15.974	May 2021	-		-		-		-	-	-	-
Shape Memory Alloys	FFRDC	Oakridge National Laboratory : Oakridge, TN	-	4.836	May 2021	-		-		-		-	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 7						R-1 Program Element (Number/Name) PE 0607210D8Z / <i>Industrial Base Analysis and Sustainment Support</i>						Project (Number/Name) 819 / <i>Industrial Base Analysis and Sustainment</i>			
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Services' Project Management Support and Technical Project Efforts (multiple efforts)	MIPR	multiple/various : multiple/various	1.747	5.497	Jun 2021	-		2.479	Jun 2022	-		2.479	-	-	-
Congressional Adds FY22 - all projects pending planning and contract actions	C/TBD	TBD : TBD	-	-		277.550	Mar 2023	-		-		-	-	-	-
Subtotal			211.527	152.840		324.655		581.544		-		581.544	-	-	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contracting fees and support services various Gov	MIPR	various : various	0.560	4.354	Mar 2021	-		-		-		-	-	-	-
Joint Army NASA Air Force (JANNAF) Executive Committee Support	C/FFP	Johns Hopkins : MD	0.505	0.123	Sep 2021	0.260	Sep 2022	0.265	Sep 2023	-		0.265	-	-	-
ODASD(Industrial Policy) SETA Support	C/IDIQ	SPA & LMI : VA	-	2.500	Apr 2021	-		-		-		-	-	-	-
Subtotal			1.065	6.977		0.260		0.265		-		0.265	-	-	N/A
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
OSD SETA Support	Various	Frontier Technologies Inc : VA	15.311	3.628	Sep 2020	1.500	Nov 2021	5.271	Nov 2022	-		5.271	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 7						R-1 Program Element (Number/Name) PE 0607210D8Z / Industrial Base Analysis and Sustainment Support						Project (Number/Name) 819 / Industrial Base Analysis and Sustainment			
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Army/Navy Program Management	MIPR	DEVCOM CBC, NSWC Crane, PEO Stri : IL/IN/FL	-	3.012	Feb 2021	0.995	Dec 2021	1.014	Dec 2022	-		1.014	-	-	-
Subtotal			15.311	6.640		2.495		6.285		-		6.285	-	-	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			227.903	166.457		327.410		588.094		-		588.094	-	-	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense											Date: April 2022				
Appropriation/Budget Activity 0400 / 7						R-1 Program Element (Number/Name) PE 0607210D8Z / Industrial Base Analysis and Sustainment Support						Project (Number/Name) 819 / Industrial Base Analysis and Sustainment			

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
All Sectors																												
Workforce All Efforts																												
Non-Workforce All Efforts																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607210D8Z / Industrial Base Analysis and Sustainment Support	Project (Number/Name) 819 / Industrial Base Analysis and Sustainment	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
All Sectors				
Workforce All Efforts	3	2022	4	2027
Non-Workforce All Efforts	3	2022	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 7					R-1 Program Element (Number/Name) PE 0607210D8Z / Industrial Base Analysis and Sustainment Support				Project (Number/Name) 821 / Microelectronics			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
821: Microelectronics	-	3.750	8.000	-	-	-	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The FY 2023 IBAS budget reflects the DoDs commitment to ensuring our supply chains can supply our warfighters with decisive advantage and includes investments to respond to E.O. 14017 and ICR findings and recommendations for the strategic and enabling focus areas, as well as investments needed for emerging modernization priorities and technologies and other defense requirements.												
This is the result of significant coordination for each strategic focus area via cross-functional teams (CFT). These CFTs developed an integrated and prioritized investment strategy to address the most pressing needs for each focus area, to include mapping to investment authorities. The FY 2023 IBAS budget reflects the outcome of the CFT recommendations and has been coordinated to complement adjacent investments of related programs including the Defense Production Act (DPA) Title III, Manufacturing Technology (ManTech) program, and at the Service level. Accordingly, investments in the following strategic focus areas will establish, sustain, and expand domestic capabilities and capacities to build more sustainable and resilient												
Microelectronics components are the foundation of modern military systems. The Department of Defense (DoD) is exposed to various vulnerabilities that threaten the ability to source microelectronics needed to sustain programs of record. In order to prepare the Department for Great Power Competition, the Department must take action to ensure access to the microelectronic components needed to sustain our defense programs and systems effectively and affordably. The Department also needs a better strategy to transition leading edge technology developed by both government and industry to DoD programs of record, to ensure the Department maintains a competitive edge.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: Microelectronics Cross Functional Team									3.750	8.000	-	
Description: The Cross-Functional Team (CFT) was established effective January 2021 to develop a DoD strategy, implementation, and transition plan to increase efficiency and minimize vulnerabilities within the Department's microelectronic supply chain, strengthening the domestic microelectronics Industrial Base and efforts to cost-effectively modernize and sustain DoD systems.												
FY 2022 Plans: The CFT will continue to develop the DoD strategy, and develop a roadmap to execute, which includes funding, policy, and legislation to ensure the strategy is successfully executed.												
FY 2022 to FY 2023 Increase/Decrease Statement:												

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607210D8Z / <i>Industrial Base Analysis and Sustainment Support</i>	Project (Number/Name) 821 / <i>Microelectronics</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
Decrease of \$8.0M from FY 2022 to FY 2023 reflects transition of Microelectronics funding to Program Element 0604294D8Z Microelectronics under OUSD(R&E).			
Accomplishments/Planned Programs Subtotals		3.750	8.000
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 7						R-1 Program Element (Number/Name) PE 0607210D8Z / <i>Industrial Base Analysis and Sustainment Support</i>						Project (Number/Name) 821 / <i>Microelectronics</i>			
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Microelectronics Studies, Strategic Initiatives, and Policy Assessments	C/FFP	CTC Aero, : Port Jefferson, NY	-	1.818		3.220	Dec 2021	-		-		-	-	-	-
Microelectronics Study	FFRDC	Institute for Defense Analysis : VA	-	-		0.500	Jan 2022	-		-		-	-	-	-
Subtotal			-	1.818		3.720		-		-		-	-	-	N/A
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Reimburse Program Management Support from Various DoD Organizations	MIPR	Various : Various	-	0.668	Jul 2021	1.469	Dec 2021	-		-		-	-	-	-
SETA Program Management Support via FFRDC	FFRDC	Aerospace : CA	-	0.400	Mar 2021	0.870	Dec 2021	-		-		-	-	-	-
SETA Program Management Support Contract	C/CPFF	Various : Various	-	0.829	Jun 2021	1.590	Feb 2022	-		-		-	-	-	-
Expenses, Building Rent & Pentagon Force Protection Services	MIPR	GSA : VA	-	0.035	Oct 2020	0.351	Nov 2021	-		-		-	-	-	-
Subtotal			-	1.932		4.280		-		-		-	-	-	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	3.750		8.000		-		-		-	-	-	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense										Date: April 2022			
Appropriation/Budget Activity					R-1 Program Element (Number/Name)					Project (Number/Name)			
0400 / 7					PE 0607210D8Z / Industrial Base Analysis and Sustainment Support					821 / Microelectronics			

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Microelectronics																												
Defense Microelectronics Cross-Functional Team																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607210D8Z / Industrial Base Analysis and Sustainment Support	Project (Number/Name) 821 / Microelectronics	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Microelectronics				
Defense Microelectronics Cross-Functional Team	1	2022	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0607310D8Z I <i>CWMD Systems: Operational Systems Development</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	35.493	16.332	18.616	15.427	-	15.427	15.968	15.720	16.451	14.563	-	-
242: <i>CWMD Systems: Operational System Development</i>	35.493	16.332	18.616	15.427	-	15.427	15.968	15.720	16.451	14.563	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Defend the Homeland, Provide Nuclear Deterrence, and Build Sustainable and Long-Term Advantage.

The Countering Weapons of Mass Destruction (CWMD) Systems portfolio aligns with the National Defense Strategy objective of “dissuading, preventing, or deterring state adversaries and non-state actors from acquiring, proliferating, or using weapons of mass destruction.”

The CWMD Systems portfolio enhances warfighter lethality by developing capabilities to exploit and defeat critical nodes of nuclear, chemical and biological weapons, ballistic missile programs, and proliferation networks; additionally the program develops offensively-oriented capabilities to disrupt Weapons of Mass Destruction (WMD) proliferation networks and detect, disable, or defeat WMD and delivery systems. Investments result in capabilities fielded to the Joint Force, enabling it to reduce WMD threats and create options for the United States to prevent WMD use.

The Office of the Secretary of Defense uses the CWMD Systems portfolio to invest strategically in projects across the Military Services, Combatant Commands, and Defense Agencies. Funding is prioritized for projects that close Joint Force warfighter capability gaps. An annual investment strategy is used to meet emergent operational and capability needs validated by the Joint Force, yielding new fielded capabilities within one to two years.

The CWMD Systems: Operational Systems Development program invests in upgrades of and enhancements to fielded systems that counter WMD proliferation. Funds are used for integration of operational prototypes into fielded systems, or other upgrades and enhancements, including any necessary test and evaluation. Investments modernize existing counter WMD capabilities within the Department of Defense to enhance the Joint Force’s lethality by upgrading and enhancing currently fielded systems. Upgraded capabilities illuminate WMD networks; exploit vulnerabilities in networks, programs, facilities, and weapons systems; and disable or defeat WMD and their delivery systems.

This program funds labor, materials, and travel requirements, performed by a government agency or by private individuals or organizations under a contract with the government, for activities and acquisitions including RDT&E, assessments and analyses, research studies, education, and other activities related to capability development and fielding.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
0400: Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development		PE 0607310D8Z I CWMD Systems: Operational Systems Development			
B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	16.954	18.721	0.000	-	0.000
Current President's Budget	16.332	18.616	15.427	-	15.427
Total Adjustments	-0.622	-0.105	15.427	-	15.427
• Congressional General Reductions	-	-0.105			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.622	-			
• Adjustments to Budget Year	-	-	15.427	-	15.427
<u>Change Summary Explanation</u>					
FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.					

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 7					R-1 Program Element (Number/Name) PE 0607310D8Z / CWMD Systems: Operational Systems Development				Project (Number/Name) 242 / CWMD Systems: Operational System Development			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
242: CWMD Systems: Operational System Development	35.493	16.332	18.616	15.427	-	15.427	15.968	15.720	16.451	14.563	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Defend the Homeland, Provide Nuclear Deterrence, and Build Sustainable and Long-Term Advantage.

The Countering Weapons of Mass Destruction (CWMD) Systems portfolio aligns with the National Defense Strategy objective of “dissuading, preventing, or deterring state adversaries and non-state actors from acquiring, proliferating, or using weapons of mass destruction.”

The CWMD Systems portfolio enhances warfighter lethality by developing capabilities to exploit and defeat critical nodes of nuclear, chemical and biological weapons, ballistic missile programs, and proliferation networks; additionally the program develops offensively-oriented capabilities to disrupt Weapons of Mass Destruction (WMD) proliferation networks and detect, disable, or defeat WMD and delivery systems. Investments result in capabilities fielded to the Joint Force, enabling it to reduce WMD threats and create options for the United States to prevent WMD use.

The Office of the Secretary of Defense uses the CWMD Systems portfolio to invest strategically in projects across the Military Services, Combatant Commands, and Defense Agencies. Funding is prioritized for projects that close Joint Force warfighter capability gaps. An annual investment strategy is used to meet emergent operational and capability needs validated by the Joint Force, yielding new fielded capabilities within one to two years.

The CWMD Systems: Operational Systems Development program invests in upgrades of and enhancements to fielded systems that counter WMD proliferation. Funds are used for integration of operational prototypes into fielded systems, or other upgrades and enhancements, including any necessary test and evaluation. Investments modernize existing counter WMD capabilities within the Department of Defense to enhance the Joint Force’s lethality by upgrading and enhancing currently fielded systems. Upgraded capabilities illuminate WMD networks; exploit vulnerabilities in networks, programs, facilities, and weapons systems; and disable or defeat WMD and their delivery systems.

This program funds labor, materials, and travel requirements, performed by a government agency or by private individuals or organizations under a contract with the government, for activities and acquisitions including RDT&E, assessments and analyses, research studies, education, and other activities related to capability development and fielding.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: CWMD Systems: Operational Systems Development	16.332	18.616	15.427

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607310D8Z / CWMD Systems: Operational Systems Development	Project (Number/Name) 242 / CWMD Systems: Operational System Development	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>Description: The CWMD Systems: Operational Systems Development program invests in upgrades of and enhancements to fielded systems that counter WMD proliferation. Funds are used for integration of operational prototypes into fielded systems, or other upgrades and enhancements, including any necessary test and evaluation. Investments modernize existing counter WMD capabilities within the Department of Defense to enhance the Joint Force's lethality by upgrading and enhancing currently fielded systems. Upgraded capabilities illuminate WMD networks; exploit vulnerabilities in networks, programs, facilities, and weapons systems; and disable or defeat WMD and their delivery systems.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> • Enhance Service and Combatant Command capabilities to detect, disable, or defeat WMD. • Upgrade and enhance DoD capabilities to counter WMD proliferation. • Enhance AFTAC capabilities to support nuclear treaty monitoring and nuclear event detection. • Upgrade or enhance fielded systems for the Joint Force to detect, disrupt, and defeat WMD and WMD networks. Projects are classified. <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> • Enhance Service and Combatant Command capabilities to detect, disable, or defeat WMD. • Upgrade and enhance DoD capabilities to counter WMD proliferation. • Enhance AFTAC capabilities to support nuclear treaty monitoring and nuclear event detection. • Upgrade or enhance fielded systems for the Joint Force to detect, disrupt, and defeat WMD and WMD networks. Projects are classified. <p>FY 2022 to FY 2023 Increase/Decrease Statement: The FY2023 funding decrease will result in the resourcing of 3-5 fewer advanced Research & Development (R&D) projects, and fewer CWMD capabilities fielded to the joint force.</p>			
Accomplishments/Planned Programs Subtotals		16.332	18.616
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks N/A			
D. Acquisition Strategy The Office of the Deputy Assistant Secretary of Defense for Threat Reduction and Arms Control (ODASD(TRAC)) establishes annual priorities based on national and DoD strategies and senior leader guidance. Based on those priorities, TRAC solicits project proposals from Combatant Commands, Military Services, and Defense			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607310D8Z / CWMD Systems: Operational Systems Development	Project (Number/Name) 242 / CWMD Systems: Operational System Development
<p>Agencies, and interagency partners. To be selected, a proposed project must have a validated requirement, an engaged requirement champion, a viable acquisition strategy, and a qualified program management office. A technology project must identify its starting and desired end-state Technology Readiness Level. Likewise, the end-user for any proposed project must demonstrate a long-term plan for acceptance and sustainment of a fieldable capability. Project period of performance is typically 12-18 months.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 7						R-1 Program Element (Number/Name) PE 0607310D8Z / CWMD Systems: Operational Systems Development				Project (Number/Name) 242 / CWMD Systems: Operational System Development					
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Upgrade & enhance Special Operations Forces (SOF) CWMD capabilities	MIPR	USSOCOM : TBD	7.723	5.390	Jan 2021	8.377	Jan 2022	6.944	Jan 2023	-		6.944	-	-	-
Enhance Service capabilities to detect, disable, or defeat WMD	Various	TBD : TBD	7.722	5.390	Feb 2021	2.978	Jan 2022	2.468	Jan 2023	-		2.468	-	-	-
Enhance Air Force Technical Applications Center (AFTAC) capabilities to support nuclear treaty monitoring and nuclear event detection	MIPR	AFTAC : TBD	7.724	5.552	Jan 2021	3.351	Jan 2022	2.776	Jan 2023	-		2.776	-	-	-
Upgrade fielded CWMD Systems	Various	Various : Various	12.324	-		3.910	Jan 2022	3.239	Jan 2023	-		3.239	-	-	-
Subtotal			35.493	16.332		18.616		15.427		-		15.427	-	-	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			35.493	16.332		18.616		15.427		-		15.427	-	-	N/A
Remarks N/A.															

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Exhibit R-4. RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense

Date: April 2022

Appropriation/Budget Activity

0400 / 7

R-1 Program Element (Number/Name)

PE 0607310D8Z / CWMD Systems: Operational Systems Development

Project (Number/Name)

242 / CWMD Systems: Operational System Development

CWMD Systems: Operational System Development
BA 7 / PE 0607310D8Z

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 7: Operational Systems Development</i>					R-1 Program Element (Number/Name) PE 0303140D8Z / <i>Information Systems Security Program</i>							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	127.304	46.529	69.191	43.135	-	43.135	17.076	10.298	9.509	9.453	Continuing	Continuing
140: <i>Information Systems Security Program</i>	127.304	46.529	69.191	43.135	-	43.135	17.076	10.298	9.509	9.453	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Defend the Homeland and Build Sustainable and Long-Term Advantage.

The DoD CIO Information Systems Security Program (ISSP) provides for focused research, development, testing and integration of technology and technical solutions critical to the Defense Cybersecurity and Information Assurance (CS&IA) Program to meet the requirements of 10 USC 2224 (Defense Information Assurance Program), 44 USC 3544, (Federal Information Security Management Act of 2002), OMB Circular A-130, and DoD Directives/Instructions 8500, 8510, 8520, 8530, and 8540. This program is funded under Budget Activity 7, Operational System Development, because it integrates technology and technical solutions to the Defense CS&IA Program.

ISSP RDT&E supports the DoD CIO and its mission partners: on architecting, engineering, and technical matters for developing governance processes and structures; on evolving and enabling a more integrated and synchronized Joint Information Environment (JIE) to provide the means for more integrated information sharing and collaboration that also endeavors to close identified gaps across all mission areas with a shared network of core enterprise services; on the continued development of the U.S. Government's ability to prevent and defend against adversarial and/or commercial information and communications technology supply-chain attacks on its mission critical systems, networks, and devices; on improving oversight of the life-cycle management of cybersecurity risks; and on the integration of cybersecurity standards, methods, and procedures across the DoD for a more robust and resilient cybersecurity posture.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022		
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development		R-1 Program Element (Number/Name) PE 0303140D8Z I Information Systems Security Program				
B. Program Change Summary (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget		46.529	49.191	0.000	-	0.000
Current President's Budget		46.529	69.191	43.135	-	43.135
Total Adjustments		0.000	20.000	43.135	-	43.135
• Congressional General Reductions		-	-			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-	-			
• Congressional Adds		-	20.000			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-	-			
• Adjustments to Budget Year		-	-	43.135	-	43.135
Congressional Add Details (\$ in Millions, and Includes General Reductions)						
Project: 140: Information Systems Security Program						
Congressional Add: ISSP - Center for academic excellence						
Congressional Add Subtotals for Project: 140						
Congressional Add Totals for all Projects						
Change Summary Explanation						
FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2021	FY 2022	FY 2023
Title: Information Systems Security Program Plans and Accomplishments				46.529	49.191	43.135
FY 2022 Plans:						
• Work with industry to develop new technologies that upgrade cybersecurity to current legacy networks and have the potential to evolve into systems that are part of a new cybersecurity architecture and command and control capability.						
• Continue to develop and refine policies to support strategies for acquisition program protection and oversight. Develop strategies, standards, and tools to address supply chain risk management, and continue to collaborate with private industry for commercially acceptable global sourcing and supply chain standards.						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0303140D8Z I <i>Information Systems Security Program</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> • Continue to evaluate cyber activities for more efficient mitigation investment decisions, to include metrics focused on the cybersecurity domain, and support for policy development and refinement, policy oversight and formulation of programmatic advice, and participation in various collaborative advisory and governance bodies. • Accelerate Cloud security guidance and procedures by commercial Cloud service providers, and continued refinement and oversight of policies and capabilities to support comprehensive cybersecurity capability for secure mobility processes in the Joint Information Environment. • Continue development and engineering support for critical Joint Information architectures, C4I tactical networks, coalition, and mission partner's networks. Support includes implementing the joint information environment single security architecture and strategy, related metrics, analyses, Joint Information Environment Single Security Architecture (SSA) policies, architectures, and capabilities to ensure best value architectural decisions are made early to affect the most impact, while increasing mission and security for the entire DoD enterprise. • Continue to develop and implement strategies for successful defenses and operations in the event of sophisticated cyber adversaries and large-scale cyber incidents, to include threat-based system-security-engineering efforts and development of critical design artifacts (threat analyses, risk analyses, system-of- system-security architectures). • Support analyses on various aspects of cybersecurity for cloud-based computing for the DoD, applicable risk factors, and continual refinement of mitigation controls as part of the risk management framework regime in support of DoD CIO's goal of accelerating the adoption of cloud computing within the department. Robust and comprehensive Cloud Risk Management will assist the DoD community with addressing security requirements for systems transitioning to the commercial cloud. • Continue refinement and integration of policies with the risk management framework (RMF), supportive standards, guidance, efficiencies, and web-based processes to strengthen controls and protections for information systems. • Continue to improve mission assurance, mitigation analyses, and vulnerability detection (hardware and software testing) for acquisitions to build-in cybersecurity early (i.e., cybersecurity built in vice bolted on), especially key acquisition programs-of-record (i.e., Major Automated Information Systems; Major Defense Acquisition Programs, and other special interest developmental and acquisition activities). Investments include Program Protection, Systems Engineering, and Acquisition standards. <p>FY 2023 Plans: \$35.290 million: Classified Add</p>				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0303140D8Z / <i>Information Systems Security Program</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
\$7.845 million: <ul style="list-style-type: none"> • Work with industry to develop new technologies that upgrade cybersecurity to current legacy networks and have the potential to evolve into systems that are part of a new cybersecurity architecture and command and control capability. • Continue to develop and refine policies to support strategies for acquisition program protection and oversight. Develop strategies, standards, and tools to address supply chain risk management, and continue to collaborate with private industry for commercially acceptable global sourcing and supply chain standards. • Continue to evaluate cyber activities for more efficient mitigation investment decisions, to include metrics focused on the cybersecurity domain, and support for policy development and refinement, policy oversight and formulation of programmatic advice, and participation in various collaborative advisory and governance bodies. • Accelerate Cloud security guidance and procedures by commercial Cloud service providers, and continued refinement and oversight of policies and capabilities to support comprehensive cybersecurity capability for secure mobility processes in the Joint Information Environment. • Continue development and engineering support for critical Joint Information architectures, C4I tactical networks, coalition, and mission partner's networks. Support includes implementing the joint information environment single security architecture and strategy, related metrics, analyses, Joint Information Environment Single Security Architecture (SSA) policies, architectures, and capabilities to ensure best value architectural decisions are made early to affect the most impact, while increasing mission and security for the entire DoD enterprise. • Continue to develop and implement strategies for successful defenses and operations in the event of sophisticated cyber adversaries and large-scale cyber incidents, to include threat-based system-security-engineering efforts and development of critical design artifacts (threat analyses, risk analyses, system-of- system-security architectures). • Support analyses on various aspects of cybersecurity for cloud-based computing for the DoD, applicable risk factors, and continual refinement of mitigation controls as part of the risk management framework regime in support of DoD CIO's goal of accelerating the adoption of cloud computing within the department. Robust and comprehensive Cloud Risk Management will assist the DoD community with addressing security requirements for systems transitioning to the commercial cloud. • Continue refinement and integration of policies with the risk management framework (RMF), supportive standards, guidance, efficiencies, and web-based processes to strengthen controls and protections for information systems. 				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022	
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development</i>					R-1 Program Element (Number/Name) PE 0303140D8Z I <i>Information Systems Security Program</i>						

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> Continue to improve mission assurance, mitigation analyses, and vulnerability detection (hardware and software testing) for acquisitions to build-in cybersecurity early (i.e., cybersecurity built in vice bolted on), especially key acquisition programs-of-record (i.e., Major Automated Information Systems; Major Defense Acquisition Programs, and other special interest developmental and acquisition activities). Investments include Program Protection, Systems Engineering, and Acquisition standards. <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> FY 2023 decrease due to change in classified program level of effort.</p>			
Accomplishments/Planned Programs Subtotals	46.529	49.191	43.135

	FY 2021	FY 2022
<p><i>Congressional Add:</i> ISSP - Center for academic excellence</p> <p><i>FY 2022 Plans:</i> • • Create a talent marketplace to recruit and retain current cyber professionals. • Develop the next generation federal cyber workforce. • Advance academic resources for emerging cyber workforce operational requirements.</p>	-	20.000
Congressional Adds Subtotals	-	20.000

D. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• PE 0303140D8Z O&M DW: <i>Information System Security Program</i>	19.118	16.263	18.584	-	18.584	17.971	17.850	17.311	16.749	-	-

Remarks

E. Acquisition Strategy
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 7						R-1 Program Element (Number/Name) PE 0303140D8Z / Information Systems Security Program				Project (Number/Name) 140 / Information Systems Security Program					
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Studies and Analysis	Option/Various	Various : Various	5.565	1.962	Jul 2021	-		-		-		-	-	-	-
Technical Engineering Services	Option/Various	Various : Various	69.982	35.222	Jul 2021	56.088	Jul 2022	33.785	Feb 2023	-		33.785	-	-	-
Services Support	Option/Various	Various : Various	21.280	0.194	Jul 2021	-		-		-		-	-	-	-
Subtotal			96.827	37.378		56.088		33.785		-		33.785	-	-	N/A
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Option/Various	Various : Various	2.230	0.394	Jul 2021	8.361	Mar 2022	8.612	Mar 2023	-		8.612	Continuing	Continuing	-
Engineering Support	Option/Various	Various : Various	19.743	6.599	Jul 2021	4.742	Apr 2022	0.738	Apr 2023	-		0.738	Continuing	Continuing	-
Research & Development	Option/Various	Various : Various	8.504	2.158	Jul 2021	-		-		-		-	-	-	-
Subtotal			30.477	9.151		13.103		9.350		-		9.350	Continuing	Continuing	N/A
Remarks NA															
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			127.304	46.529		69.191		43.135		-		43.135	Continuing	Continuing	N/A
Remarks NA															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0303140D8Z / <i>Information Systems Security Program</i>	Project (Number/Name) 140 / <i>Information Systems Security Program</i>

R4; PE 303140D8Z; Information Systems Security Program					
	10/1/2022	10/1/2023	10/1/2024	10/1/2025	10/1/2026
FY2023 Program Execution					
FY2024 Program Execution					
FY2025 Program Execution					
FY2026 Program Execution					
FY2027 Program Execution					

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0303140D8Z / Information Systems Security Program	Project (Number/Name) 140 / Information Systems Security Program	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
*** SUBPROJECT TITLE ***				
FY 2022 Projected Execution	1	2022	4	2023
FY 2023 Projected Execution	1	2023	4	2024
FY 2024 Projected Execution	1	2024	4	2025
FY 2025 Projected Execution	1	2025	4	2026
FY2026 Projected Execution	1	2026	4	2027
FY2027 Project Execution	1	2027	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0305104D8Z I <i>Securing the Defense Industrial Base (DIB): Cybersecurity Maturity Model Certification (CMMC)</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	-	-	10.000	-	10.000	14.000	14.000	14.000	14.000	Continuing	Continuing
334: <i>Securing the DIB: CMMC</i>	-	-	-	10.000	-	10.000	14.000	14.000	14.000	14.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

New Start (Y/N): No

CMMC is a continuation of efforts contained in PE 0606771D8Z, Cyber Resiliency & Cybersecurity Policy.

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression, Defend the Homeland, and Build Sustainable and Long-Term Advantage.

Development, implementation and sustainment of the Cybersecurity Maturity Model Certification (CMMC) framework that incorporates multiple cybersecurity standards and references into a unified standard that encompasses both the progression of cybersecurity practices as well as the maturity of processes to secure Controlled Unclassified Information (CUI) within the Defense Industrial Base (DIB) sector.

Conduct pathfinders to assess the feasibility and efficacy of employing emerging commercial services/tools/platforms that provide insights into cybersecurity threats and vulnerabilities that are relevant to the DIB sector and the DoD supply chain.

Partner with the DIB sector to demonstrate cost-effective and scalable cybersecurity services that augment and/or enhance existing commercial capabilities and services. Focus on cybersecurity services for small-to-medium sized DIB companies that are critical to the DoD supply chain but lack sufficient cybersecurity capabilities to protect CUI.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022		
Appropriation/Budget Activity		R-1 Program Element (Number/Name)				
0400: Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development		PE 0305104D8Z I Securing the Defense Industrial Base (DIB): Cybersecurity Maturity Model Certification (CMMC)				
B. Program Change Summary (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget		0.000	0.000	0.000	-	0.000
Current President's Budget		0.000	0.000	10.000	-	10.000
Total Adjustments		0.000	0.000	10.000	-	10.000
• Congressional General Reductions		-	-			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-	-			
• Congressional Adds		-	-			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-	-			
• Adjustments to Budget Year		-	-	10.000	-	10.000
Congressional Add Details (\$ in Millions, and Includes General Reductions)					FY 2021	FY 2022
Project: 334: Securing the DIB: CMMC						
Congressional Add: N/A					0.000	0.000
Congressional Add Subtotals for Project: 334					0.000	0.000
Congressional Add Totals for all Projects					0.000	0.000
Change Summary Explanation						
FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.						
The FY23 increase enables the Department to contract with the most secure DIB partners on priority Controlled Unclassified Information projects via the Cybersecurity Maturity Model Certification (CMMC) initiative. Additionally, the funds are required to complete Enterprise Mission Assurance Support Service (eMASS) database upgrades to maintain infrastructure required for CMMC.						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2021	FY 2022	FY 2023
Title: Securing the DIB: CMMC				0.000	-	10.000
FY 2023 Plans:						
- Implement the revised Cybersecurity Maturity Model Certification (CMMC) framework based on the outcome of rule-making, emerging cyber threats, and DoD leadership decisions.						
- Execute CMMC Pilots in concert with Military Services, DoD agencies, and international partners in support of the CMMC roll-out.						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development		R-1 Program Element (Number/Name) PE 0305104D8Z I Securing the Defense Industrial Base (DIB): Cybersecurity Maturity Model Certification (CMMC)	

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> - Conduct risk reduction pathfinders on the implementation of CMMC Level 3 enhanced security requirements. - Develop and test full operational capability of the CMMC Enterprise Mission Assurance Support Service (Emass) database execute periodic releases. - Partner with the DIB sector to analyze and demonstrate promising and cost-effective capabilities and candidate solutions related to supply chain risk management and DIB cybersecurity. <p>FY 2022 to FY 2023 Increase/Decrease Statement: The FY23 increase enables the Department to contract with the most secure DIB partners on priority Controlled Unclassified Information projects via the Cybersecurity Maturity Model Certification (CMMC) initiative. Additionally, the funds are required to complete Enterprise Mission Assurance Support Service (eMASS) database upgrades to maintain infrastructure required for CMMC.</p>			
Accomplishments/Planned Programs Subtotals	0.000	-	10.000

	FY 2021	FY 2022
Congressional Add: N/A	0.000	0.000
FY 2021 Accomplishments: N/A		
FY 2022 Plans: N/A		
Congressional Adds Subtotals	0.000	0.000

D. Other Program Funding Summary (\$ in Millions)
N/A
Remarks
E. Acquisition Strategy
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022		
Appropriation/Budget Activity 0400 / 7				R-1 Program Element (Number/Name) PE 0305104D8Z / <i>Securing the Defense Industrial Base (DIB): Cybersecurity Maturity Model Certification (CMMC)</i>				Project (Number/Name) 334 / <i>Securing the DIB: CMMC</i>						

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost		Cost To Complete	Total Cost	Target Value of Contract
Technical Support Services	Option/Various	Various : Various	-	-		-		10.000	Mar 2023	-		10.000		Continuing	Continuing	-
Subtotal			-	-		-		10.000		-		10.000		Continuing	Continuing	N/A

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-	-	10.000	-	10.000	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense			Date: April 2022	
Appropriation/Budget Activity 0400 / 7		R-1 Program Element (Number/Name) PE 0305104D8Z / <i>Securing the Defense Industrial Base (DIB): Cybersecurity Maturity Model Certification (CMMC)</i>		Project (Number/Name) 334 / <i>Securing the DIB: CMMC</i>

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<i>Securing The DIB: CMMC</i>																												
FY23 Projected Execution																												
FY24 Projected Execution																												
FY25 Projected Execution																												
FY26 Projected Execution																												
FY27 Projected Execution																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0305104D8Z / Securing the Defense Industrial Base (DIB): Cybersecurity Maturity Model Certification (CMMC)	Project (Number/Name) 334 / Securing the DIB: CMMC	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Securing The DIB: CMMC				
FY23 Projected Execution	1	2023	4	2024
FY24 Projected Execution	1	2024	4	2025
FY25 Projected Execution	1	2025	4	2026
FY26 Projected Execution	1	2026	4	2027
FY27 Projected Execution	1	2027	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0305172D8Z I <i>Combined Advanced Applications</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	49.380	-	49.380	52.440	61.320	60.530	65.650	Continuing	Continuing
333: <i>Combined Advanced Applications</i>	-	0.000	0.000	49.380	-	49.380	52.440	61.320	60.530	65.650	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

New Start (Y/N): No, it is a continuation of efforts from a preexisting PE.

A. Mission Description and Budget Item Justification

Combined Advanced Applications details are reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	49.380	-	49.380
Total Adjustments	0.000	0.000	49.380	-	49.380
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Year	-	-	49.380	-	49.380

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 333: *Combined Advanced Applications*

Congressional Add: *N/A*

	FY 2021	FY 2022
	0.000	0.000
Congressional Add Subtotals for Project: 333	0.000	0.000
Congressional Add Totals for all Projects	0.000	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I</i> BA 7: <i>Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0305172D8Z <i>I Combined Advanced Applications</i>	
<p>Change Summary Explanation</p> <p>FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.</p> <p>FY 2023 increase reflects Combined Advanced Applications transfer to the DoD CIO.</p>			
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
Title: Combined Advanced Applications		0.000	-
Description: Information is classified.			
FY 2023 Plans: Information is classified.			
FY 2022 to FY 2023 Increase/Decrease Statement: FY23 increase reflects Combined Advanced Applications transfer to the DoD CIO.			
Accomplishments/Planned Programs Subtotals		0.000	-
		FY 2021	FY 2022
Congressional Add: N/A		0.000	0.000
FY 2021 Accomplishments: N/A			
FY 2022 Plans: N/A			
Congressional Adds Subtotals		0.000	0.000
D. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
E. Acquisition Strategy			
N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 7						R-1 Program Element (Number/Name) PE 0305172D8Z / Combined Advanced Applications				Project (Number/Name) 333 / Combined Advanced Applications					
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Engineering Services	Option/Various	Various : Various	-	-		-		28.640	Jul 2023	-		28.640	Continuing	Continuing	-
Services Support	Option/Various	Various : Various	-	-		-		10.070	May 2023	-		10.070	Continuing	Continuing	-
Subtotal			-	-		-		38.710		-		38.710	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support	Option/Various	Various : Various	-	-		-		10.670	Jul 2023	-		10.670	Continuing	Continuing	-
Subtotal			-	-		-		10.670		-		10.670	Continuing	Continuing	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-		-		49.380		-		49.380	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense																Date: April 2022			
Appropriation/Budget Activity 0400 / 7								R-1 Program Element (Number/Name) PE 0305172D8Z / Combined Advanced Applications								Project (Number/Name) 333 / Combined Advanced Applications			

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Information is classified																												
FY23 Projected Execution																												
FY24 Projected Execution																												
FY25 Projected Execution																												
FY26 Projected Execution																												
FY27 Projected Execution																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0305172D8Z / Combined Advanced Applications	Project (Number/Name) 333 / Combined Advanced Applications	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Information is classified				
FY23 Projected Execution	1	2023	4	2024
FY24 Projected Execution	1	2024	4	2025
FY25 Projected Execution	1	2025	4	2026
FY26 Projected Execution	1	2026	4	2027
FY27 Projected Execution	1	2027	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0305186D8Z I Policy R&D Programs							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	48.514	6.322	4.591	6.214	-	6.214	6.228	6.227	6.228	6.228	-	-
186: Policy R&D Programs	48.514	6.322	4.591	6.214	-	6.214	6.228	6.227	6.228	6.228	-	-

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Defend the Homeland, and Deter Aggression.

The Policy R&D Program supports the National Defense Strategy by providing analysis to overcome military security challenges. Since the global environment is dynamic, research is necessary for continued understanding of military structures, foreign cultures, and ethnic issues. Examines demographic data, investigates future global security challenges, provides insights to inform critical national security decisions, explores ways to build partnership capabilities to counter organizational warfare, develop foreign military infrastructure, and deny sanctuary to extremist groups. Program blends several disciplines including surveillance, operations, policy, information management, cyber policy, training and technology.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	6.291	4.843	0.000	-	0.000
Current President's Budget	6.322	4.591	6.214	-	6.214
Total Adjustments	0.031	-0.252	6.214	-	6.214
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.068	-			
• Adjustment to Budget Year	0.099	-0.252	6.214	-	6.214

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 7					R-1 Program Element (Number/Name) PE 0305186D8Z / Policy R&D Programs				Project (Number/Name) 186 / Policy R&D Programs			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
186: Policy R&D Programs	48.514	6.322	4.591	6.214	-	6.214	6.228	6.227	6.228	6.228	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Provide analysis to overcome military security challenges. Since the global environment is dynamic, research is necessary for continued understanding of military structures, foreign cultures, and ethnic issues. Examines demographic data, investigates future global security challenges, provides insights to inform critical national security decisions, explores ways to build partnership capabilities to counter organizational warfare, develop foreign military infrastructure, and deny sanctuary to extremist groups. Program blends several disciplines including surveillance, operations, policy, information management, cyber policy, training and technology.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Future Security Challenges	2.031	1.583	2.514
<p>Description: Provides program management oversight and technical support to identify current and emerging future security challenges to the Department, and for international cooperation activities with Allies and international partners to confront these challenges. Anticipates exploitation of technology, including available and advanced capabilities, and work with the international commercial sector and academia concerning adversary's application of technology. Program explores processes and policy to integrate international capabilities across the spectrum of security challenges.</p> <p>FY 2022 Plans: Perform ongoing trend analysis and develop mitigation options for addressing program risks with increased emphasis on the INDO-PACOM AOR.</p> <ul style="list-style-type: none"> • Develop opportunities to apply risk management methodologies to identified program areas. • Working with our international partners, develop net-centric enterprise technologies to remove international sharing barriers identified with maritime information, intelligence, and data being collected by DoD and foreign governments. • Research military competition among nations in the Far and Middle East and highlight potential capabilities and policies each nation may utilize in future armed conflicts. • Continue to enhance strategies and relationships with European nations based on the exchange of information through education opportunities and existing policies. • Research and analyze particular Far (China) and Middle East countries as it relates to their decision-making process, financial position, leadership, political dynamics, technical abilities and internal social tensions and stability. • Continue research efforts within the Services and Combatant Commands to better analyze and demonstrate enduring counterinsurgency operational capabilities. <p>FY 2023 Plans:</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0305186D8Z / Policy R&D Programs	Project (Number/Name) 186 / Policy R&D Programs		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Continue efforts to include:</p> <p>Perform ongoing trend analysis and develop mitigation options for addressing program risks with increased emphasis on the INDO-PACOM AOR.</p> <ul style="list-style-type: none">• Develop opportunities to apply risk management methodologies to identified program areas.• Working with our international partners, develop net-centric enterprise technologies to remove international sharing barriers identified with maritime information, intelligence, and data being collected by DoD and foreign governments.• Research military competition among nations in the Far and Middle East and highlight potential capabilities and policies each nation may utilize in future armed conflicts.• Continue to enhance strategies and relationships with European nations based on the exchange of information through education opportunities and existing policies.• Research and analyze particular Far (China) and Middle East countries as it relates to their decision-making process, financial position, leadership, political dynamics, technical abilities and internal social tensions and stability.• Continue research efforts within the Services and Combatant Commands to better analyze and demonstrate enduring counterinsurgency operational capabilities. <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p> <p>Increase in funding is the result of FY 2022 funds being re-phased due to prior year execution levels.</p>				
<p>Title: Long Term Competitions (LTC) Program</p> <p>Description: Request supports the Long Term Competitions (LTC) program which is an analytical effort chartered to provide the DoD senior leadership with an understanding of key long-term developments and dynamics in specific areas of the global security environment, and to develop competitive strategies for their consideration as the Department seeks to address these long term challenges. The LTC Program will provide rigorously analyzed competitive strategy recommendations to these senior DoD leaders, and will require the support of organizations and experts outside of government to deliver the highest quality analysis, concepts and recommendations. Funding for the LTC program will be used to: bring outside experts into Task Force working groups and strategy review teams; contract studies; support wargaming and workshops; conduct analytical studies of key developments and dynamics, and their impact on the future security environment and U.S. military capabilities in that environment; and explore new approaches to addressing key analytical requirements.</p> <p>Assessments of the ability of future forces to achieve objectives at the campaign level. These assessments include wargaming, qualitative, and quantitative analytic methods. They will both inform and be informed by the Support for Strategic Analysis (SSA) defense planning scenarios (DPS). They will identify risk and potential trade-space among force structure, capabilities, and readiness to inform senior leader decision-making.</p> <p>FY 2022 Plans:</p>		3.591	2.308	3.000

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022	
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0305186D8Z / Policy R&D Programs	Project (Number/Name) 186 / Policy R&D Programs		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Specific efforts are classified.				
FY 2023 Plans: Specific efforts are classified.				
FY 2022 to FY 2023 Increase/Decrease Statement: Increase in funding is the result of FY 2022 funds being re-phased due to prior year execution levels.				
Title: Defense Planning Scenarios Activities		0.700	0.700	0.700
Description: This program is classified.				
FY 2022 Plans: Specific efforts are classified.				
FY 2023 Plans: Specific efforts are classified.				
FY 2022 to FY 2023 Increase/Decrease Statement: No change to planned costs.				
Accomplishments/Planned Programs Subtotals		6.322	4.591	6.214
C. Other Program Funding Summary (\$ in Millions) N/A				
Remarks				
D. Acquisition Strategy N/A				

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0305186D8Z / Policy R&D Programs	Project (Number/Name) 186 / Policy R&D Programs
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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Policy R&D Programs	Various	National Defense Univ, FFRDCs : Various	48.514	6.322		4.591		6.214		-		6.214	Continuing	Continuing	N/A
Subtotal			48.514	6.322		4.591		6.214		-		6.214	Continuing	Continuing	N/A

Remarks The Policy R&D Program provides analysis to overcome military challenges and for continued understanding of military structures, foreign cultures and ethnic issues.															
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			48.514	6.322		4.591		6.214		-		6.214	Continuing	Continuing	N/A

Remarks
NA

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0305186D8Z / Policy R&D Programs	Project (Number/Name) 186 / Policy R&D Programs
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FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

<i>The Policy R&D Program provides analysis to overcome military challenges and for continued understanding of military structures, foreign cultures and ethnic issues</i>	
Policy R&D Program	

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0305186D8Z / Policy R&D Programs	Project (Number/Name) 186 / Policy R&D Programs

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>The Policy R&D Program provides analysis to overcome military challenges and for continued understanding of military structures, foreign cultures and ethnic issues</i>				
Policy R&D Program	1	2021	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0305199D8Z / Net Centricity							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	130.524	20.994	13.132	17.917	-	17.917	23.146	20.644	19.254	19.139	Continuing	Continuing
199: GIG Evaluation Facilities (GIG-EF) and GIG Enterprise-Wide Systems Engineering Advisory Activities	130.524	20.994	13.132	17.917	-	17.917	23.146	20.644	19.254	19.139	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Deter Aggression, Defend the Homeland, and Build Sustainable and Long-Term Advantage.

The Net Centricity program provides technical analysis, systems engineering and capability oversight of programs, projects, initiatives and activities to maximize the Department's return on investment in information technology resources and affect a comprehensive approach for assessing and procuring critical information systems from initial design through capability development. Specific Command, Control, and Communications (C3) disciplines include: Tactical (Space, Aerial, Terrestrial, and Maritime) Communications, Applications, Services, Information Sharing, and Command, Control, Communications (C3) Infrastructure; Satellite Communications (SATCOM) including SATCOM terminals and gateways and associated Defense. Information Systems Network (DISN) infrastructure; commercial mobile devices, and Positioning, Navigation and Timing (PNT). DoD CIO provides strategic direction, policy guidance, and oversight that enables the Department to effectively research, define, prioritize, acquire, field, and sustain C3 capabilities in support of DoD operations and the warfighter.

These funds provide the capability for the warfighter to manage and deconflict radio frequencies through ground, air, and space communication networks. The funds will be used to develop and synchronize information assurance and mission assurance capabilities with other joint information environment capabilities to provide secure access to information and services (e.g. Cryptographic Modernization Management plan). Additionally, funding will continue to be utilized to support development of common standards and protocols across the DoD. This effort includes the Joint Interoperability Enhancement Process (IEP) that allows operators, engineers, and program managers to verify capabilities and identify issues in a design with Joint / Allied units prior to system fielding, or with fielded systems to identify required changes for systems upgrade planning.

These joint standards, protocols, and processes will be used for implementation and testing to ensure the TDL capabilities are synchronized with the development and integration timelines of other planned network-enabled DODIN initiatives. The DoD cannot assume the same robust, uninterrupted, tactical-to-strategic command and control network will remain intact against a peer-level adversary. Rather than existing across a single domain, these new network paths must leverage space, air, land, surface, sub-surface, and cyber to ensure redundancy against attack. To build confidence in our communication ability in a contested theater, the DoD must make

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022		
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development		R-1 Program Element (Number/Name) PE 0305199D8Z I Net Centricity				
targeted investments that increase communication resiliency. The Net Centricity program provides this resilient architecture and leverages multiple waveforms carried across space, air, land, surface, sub-surface and cyber to minimize periods that C2 will be degraded when communicating in a highly contested environment.						
B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	
Previous President's Budget	21.793	13.471	0.000	-	0.000	
Current President's Budget	20.994	13.132	17.917	-	17.917	
Total Adjustments	-0.799	-0.339	17.917	-	17.917	
• Congressional General Reductions	-	-				
• Congressional Directed Reductions	-	-0.339				
• Congressional Rescissions	-0.004	-				
• Congressional Adds	-	-				
• Congressional Directed Transfers	-	-				
• Reprogrammings	-	-				
• SBIR/STTR Transfer	-0.795	-				
• Adjustments to Budget Year	-	-	17.917	-	17.917	
Change Summary Explanation						
FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.						
The increase of +\$6.941 from FY 2022 to FY 2023 is due to additional modeling and simulation efforts to develop and test and spectrum measurement activities; validate and monitor the efficacy of the multiple systems Mode S IFF implementation; finalize Stage2/3 DoD/FAA/NTIA Model and predecessor metrics; Develop 5G technology standards contributions and support continued analysis in the area of Public Safety Communications (PSC) including NextGen 911, FirstNet and Land Mobile Radio (LMR).						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2021	FY 2022	FY 2023
Title: Net Centricity Plans and Accomplishments				20.994	13.132	17.917
FY 2022 Plans:						
– Continue technical assessment/refine commercial wireless policy guidance to support CMD strategy implementation; continue assessments of the effects of cybersecurity policies.						
– Continue to refine CMD certification processes, Mobile Application Management (MAM)/Mobile Device Management (MDM) guidelines, and guidelines for personal user based enforcement; update approved product matrix for CMD.						
– Continue implementation assessments to refine mobile application and device strategies.						
– Review/refine mobile application approval process guides, DoD Mobile PKI guides, and procedure for the Electronic Flight Bag (EFB).						
– Development of an analytical model that facilitates access to the 1030/1090MHz spectrum.						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0305199D8Z / <i>Net Centricity</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> – Modernize DoD’s spectrum dependent systems to a fully integrated information and decision support architecture for all-domain maneuver and fires superiority. – Develop a resilient, secure, and adaptive tactical IT infrastructure capable of operating within a contested, congested, and operationally limited within the electromagnetic Spectrum (EMS) environment, which will share EMS data across DoD at all classification levels. – Develop EMS statistical and associative modeling and simulation techniques. – Modernize spectrum data, data collection, databases, storage retrieval, and aggregation. – Develop AI-enabled spectrum data analytics. – Modernize Electromagnetic Battle Management, Situational Awareness and C2 integration. – Continue 5G experimentation for dynamic, bidirectional, cognitive spectrum sharing. – Continue technical and business case analyses for Commercial mobile devices and voice encryption. – Update the Radio and Communication Security modernization plan for tactical radios. Assess Service implementation. – Continue analysis to update the CJTF Architecture to reflect Component C4II capability plans. – Continue development of interoperable Land Mobile Radio (LMR) standards to support public safety communications. – Continue analysis to of LMR policy implementation; refine procedures to support LMR implementation in the DoD. – Continue analysis of Waveform Development and Management in the DoD. – Continue analysis to maintain authoritative list of DoD-approved waveforms and supporting repository to maintain waveform baseline. – Continue technical analysis on methods for securing ISR data over wireless platforms and extended encryption of these devices, conduct implementation assessments through UAS encryption data calls. – Continue technical analysis and support for Protected, Wideband, Narrowband, and Commercial SATCOM. Assess strategy alignment. – Update SATCOM Synchronization Architectures for Protected, Wideband, Narrowband and Commercial SATCOM capabilities. – Continue efforts to implement SATCOM Gateway Right-sizing approaches to optimize SATCOM gateways across the defense enterprise. – Continue technical/requirements analysis and feasibility assessments for implementing legacy narrowband solutions for MUOS payload. – Continue analysis to support implementation approaches for JIPM alternatives. – Conduct follow-on analysis in support of the Protected SATCOM AoA recommendations and preferred alternative. – Continue support for the WCS AOA and follow-on analysis. – Continue technical analysis to improve DoD utilization of Commercial SATCOM capabilities. – Conduct Airborne ISR (AISR) transport analysis of alternatives follow on analysis based on AoA recommendations and preferred alternatives. 				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0305199D8Z / <i>Net Centricity</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> – Continue technical analysis of Coalition C2 and MNIS, analyze Coalition C2 functional requirements, strategic policy development and capability strategies to guide Mission Partner Environment (MPE) development. – Continue technical analysis of selected joint and Service C2 programs/initiatives to promote enterprise approaches for data and services. – Continue technical analysis for the implementation of Common Mission Network Transport (CMNT) capability. – Continue technical analysis of MNIS programs and initiatives, related acquisition strategies, and functional requirements. – Continue analyses to address adoption and evolution of mission services as candidate enterprise services for the JIE. – Conduct follow-on analysis to inform implementation of the EoA recommendations for the GCCS Family of Systems. – Continue analysis of capability needs to enable command and control across the JIE. Evaluate Enterprise Operations Center architectures, and information requirements to support investment decisions in JIE C2 capabilities. – Continue analysis of requirements, capability gaps and integrated priority lists of all joint requirements for C3 capabilities to support DoD CIO engagement in the C4/Cyber Functional Capability Board. – Continue wireless architecture and advanced technologies analysis to inform Department-wide policies and implementation of mobility solutions. – Continue technical analysis to support compliance oversight of waveform policies and technical profile specifications. – Continue efforts to refine communications policies and analysis technologies applicable to commercial mobile devices. – Continue analysis to support DMUC derived credentials implementation. – Continue to develop Interoperable Secure Mobile Communications across FVEY. – Continue analysis of 5G technology for DoD tactical use. – Execute 5G standards engagement plan. – Continue to support Multi-National 5G Capability development across NATO. – Continue technical analysis for Network Management (NM) interoperability, architecture and data artifacts. – Continue systems engineering and architecture analysis for JIE tactical processing nodes (TPNs). – Continue analysis to address implementation of TSVSIC for tactical radios. – Continue efforts to determine strengths, weaknesses, and uses of waveforms and network management capabilities; identified gaps; assesse new technologies in support of waveform and network management efforts. – Continue technical analysis to support implementation of the network management strategy and roadmap. – Continue development of data techontologies and NIEM compliant IEPDs for network management. – Continue technical analysis in support of C3 policies, plans, studies, roadmaps, and capability assessments. – Continue end-to-end analysis of the SATCOM environment; support technical evaluations of end-to-end capabilities. – Continue studies and analysis in support of the DoD CIO's Mobile Device Strategy and Mobile Device Security Efforts. – Continue Hub-Based HF Communications Concept to provide protected high rate communications needed for long range connectivity in satellite-denied environments 				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0305199D8Z / <i>Net Centricity</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> – Continue Wideband SATCOM AoA user demand projections develop planning decks and scenario guidance with Joint Staff/J6 coordinated scenarios description paper and CAPE concurrence. – Continue to support secure voice interoperability and desires to drive planning for UHF anti-jam (SATURN) planning through NATO channels. – Continue technical analysis/studies related to the migration of current applications and services to DoD Core Data Centers and support rationalization of applications for the JIE. – Continue technical analysis to support implementation of JIE capability upgrades and technical planning. – Continue studies and analysis to progress of JIE technical implementation actions. – Continue technical analysis and studies related to SDN as an approach to network normalization and security. – Continue Joint IEP analysis for Link 16 and work on adding Variable Message Format (VMF), Link 11/22, Multifunction Advanced Data Link (MADL), and Common Data Link (CDL) through the FYDP. – Continue support for Allied and Coalition interoperability efforts including NATO migration plan, JSF partner interoperability, US/ Swedish MIEA, and integration of US and foreign communications and C2 systems. – Assess developing waveform technologies for improving the robustness and scalability of current TDL networks. – Continue efforts to refine and implement gateway right sizing options; evaluate RF terminal solutions and baseband equipment suites including the number and types of equipment needed to meet the future needs of the war fighter. Coordinate and facilitate Teleport Program Office oversight initiatives. – Continue analysis to evolve SATCOM networks toward EOIP modem architecture. Continue support of video dissemination and two-way GBS capabilities to inform follow on implementation across the Department. – Continue analysis for the SATCOM International Standards Committee (SISC). Participate in the development of US lead Standardized Agreements (STANAGS) and provide a technical review of other nation's STANAG's for accuracy, completeness, and feasibility. – Continue efforts to evaluate and implement acquisition strategies for U.S. support to NATO SATCOM. – Continue technical analysis and facilitate execution of the SATCOM Systems Engineering Group (SSEG). – Continue efforts to maintain JIE Infrastructure Framework and synchronization roadmap to track infrastructure deployment or implementation. – Continue acquisition like review of JIE objectives, plans, technical approaches, schedules and cost factors to support technical reviews of JIE implementation. – Support the development of business case activities as required. Develop guidance (e.g., information system security engineering guidance) and programming recommendations to ensure the integration of Trusted Systems Networks concepts and processes into the acquisition and maintenance of DoD information systems, enclaves, and services, including the purchase and integration of tactical communication commodities.				
FY 2023 Plans:				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0305199D8Z / <i>Net Centricity</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Continue technical assessment/refine commercial wireless policy guidance to support CMD strategy implementation; continue assessments of the effects of cybersecurity policies. – Continue to refine CMD certification processes, Mobile Application Management (MAM)/Mobile Device Management (MDM) guidelines, and guidelines for personal user based enforcement; update approved product matrix for CMD. – Continue implementation assessments to refine mobile application and device strategies. – Review/refine mobile application approval process guides, DoD Mobile PKI guides, and procedure for the Electronic Flight Bag (EFB). – Development of an analytical model that facilitates rapid, safe, and operationally adequate access to the 1030/1090MHz spectrum. – Develop a resilient, secure, and adaptive tactical IT infrastructure capable of operating within a contested, congested, and operationally limited electromagnetic Spectrum (EMS) environment, capable of sharing EMS data across DoD at all classification levels. – Develop EMS statistical and associative modeling and simulation techniques. – Modernize DoD's spectrum dependent systems to a fully integrated information and decision support architecture for all-domain maneuver and fires superiority. – Modernize spectrum data, data collection, databases, storage retrieval, and aggregation. – Develop AI-enabled spectrum data analytics. – Modernize Electromagnetic Battle Management, Situational Awareness and C2 integration. – Continue 5G experimentation for dynamic, bidirectional, cognitive spectrum sharing. – Continue technical and business case analyses for Commercial mobile devices and voice encryption. – Update the Radio and Communication Security modernization plan for tactical radios. Assess Service implementation. – Continue analysis to update the CJTF Architecture to reflect Component C4II capability plans. – Continue development of interoperable Land Mobile Radio (LMR) standards to support public safety communications. – Continue analysis to of LMR policy implementation; refine procedures to support LMR implementation in the DoD. – Continue analysis of Waveform Development and Management in the DoD. – Continue analysis to maintain authoritative list of DoD-approved waveforms and supporting repository to maintain waveform baseline. – Continue technical analysis on methods for securing ISR data over wireless platforms and extended encryption of these devices, conduct implementation assessments through UAS encryption data calls. – Continue technical analysis and support for Protected, Wideband, Narrowband, and Commercial SATCOM. Assess strategy alignment. – Update SATCOM Synchronization Architectures for Protected, Wideband, Narrowband and Commercial SATCOM capabilities. – Continue compliance reviews of select programs; identify shortfalls in program bandwidth supportability planning and analysis and provide recommendations for corrective action.				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0305199D8Z / <i>Net Centricity</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> – Continue efforts to implement SATCOM Gateway Right-sizing approaches to optimize SATCOM gateways across the defense enterprise. – Continue technical/requirements analysis and feasibility assessments for implementing legacy narrowband solutions for MUOS payload. – Continue analysis to support implementation approaches for JIPM alternatives. – Conduct follow-on analysis in support of the Protected SATCOM AoA recommendations and preferred alternative. – Continue support for the WCS AOA and follow-on analysis. – Continue technical analysis to improve DoD utilization of Commercial SATCOM capabilities. – Conduct Airborne ISR (AISR) transport analysis of alternatives follow on analysis based on AoA recommendations and preferred alternatives. Update AISR transport reference and solution architecture artifacts to support implementation. – Continue technical analysis of Coalition C2 and MNIS, analyze Coalition C2 functional requirements, strategic policy development and capability strategies to guide Mission Partner Environment (MPE) development. – Continue technical analysis of selected joint and Service C2 programs/initiatives to promote enterprise approaches for data and services. – Continue technical analysis for the implementation of Common Mission Network Transport (CMNT) capability. – Continue technical analysis of MNIS programs and initiatives, related acquisition strategies, and functional requirements. – Continue analyses to address adoption and evolution of mission services as candidate enterprise services for the JIE. – Conduct follow-on analysis to inform implementation of the EoA recommendations for the GCCS Family of Systems. – Continue analysis of capability needs to enable command and control across the JIE. Evaluate Enterprise Operations Center architectures, and information requirements to support investment decisions in JIE C2 capabilities. – Continue analysis of requirements, capability gaps and integrated priority lists of all joint requirements for C3 capabilities to support DoD CIO engagement in the C4/Cyber Functional Capability Board. – Continue wireless architecture and advanced technologies analysis to inform Department-wide policies and implementation of mobility solutions. – Continue technical analysis to support compliance oversight of waveform policies and technical profile specifications. – Continue efforts to refine communications policies and analysis technologies applicable to commercial mobile devices. – Continue DoD Commercial Mobility implementation and systems engineering analysis Defense Mobile Unclassified and Classified Capabilities (DMUC/DMCC). – Continue analysis to support DMUC derived credentials implementation. – Continue analysis of 5G technology for DoD tactical use. – Develop 5G standards engagement plan. – Continue technical analysis for Network Management (NM) interoperability, architecture and data artifacts. – Continue systems engineering and architecture analysis for JIE tactical processing nodes (TPNs). – Continue analysis to address implementation of TSVSIC for tactical radios. 				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0305199D8Z / <i>Net Centricity</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> – Continue efforts to determine strengths, weaknesses, and uses of waveforms and network management capabilities; identified gaps; assesse new technologies in support of waveform and network management efforts. – Continue technical analysis to support implementation of the network management strategy and roadmap. – Continue development of data ontologies and NIEM compliant IEPDs for network management. – Continue technical analysis in support of C3 policies, plans, studies, roadmaps, and capability assessments. – Continue end-to-end analysis of the SATCOM environment; support technical evaluations of end-to-end capabilities. – Continue studies and analysis in support of the DoD CIO's Mobile Device Strategy and Mobile Device Security Efforts. – Continue Hub-Based HF Communications Concept to provide protected high rate communications needed for long range connectivity in satellite-denied environments – Continue Wideband SATCOM AoA user demand projections develop planning decks and scenario guidance with Joint Staff/J6 coordinated scenarios description paper and CAPE concurrence. – Continue technical analysis/studies related to the migration of current applications and services to DoD Core Data Centers and support rationalization of applications for the JIE. – Continue technical analysis to support implementation of JIE capability upgrades and technical planning. – Continue studies and analysis to progress of JIE technical implementation actions. – Continue technical analysis and studies related to SDN as an approach to network normalization and security. – Continue Joint IEP analysis for Link 16 and work on adding Variable Message Format (VMF), through the FYDP. – Continue support for Allied and Coalition interoperability efforts including NATO migration plan, JSF partner interoperability, US/ Swedish MIEA, and integration of US and foreign communications and C2 systems. – Assess developing waveform technologies for improving the robustness and scalability of current TDL networks. – Continue efforts to refine and implement gateway right sizing options; evaluate RF terminal solutions and baseband equipment suites including the number and types of equipment needed to meet the future needs of the war fighter. Coordinate and facilitate Teleport Program Office oversight initiatives. – Continue analysis to evolve SATCOM networks toward EOIP modem architecture. Continue support of video dissemination and two-way GBS capabilities to inform follow on implementation across the Department. – Continue analysis for the SATCOM International Standards Committee (SISC). Participate in the development of US lead Standardized Agreements (STANAGS) and provide a technical review of other nation's STANAG's for accuracy, completeness, and feasibility. – Continue efforts to evaluate and implement acquisition strategies for U.S. support to NATO SATCOM. – Continue technical analysis and facilitate execution of the SATCOM Systems Engineering Group (SSEG). – Continue efforts to maintain JIE Infrastructure Framework and synchronization roadmap to track infrastructure deployment or implementation. – Continue acquisition like review of JIE objectives, plans, technical approaches, schedules and cost factors to support technical reviews of JIE implementation. 				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0305199D8Z I <i>Net Centricity</i>	
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022
<p>– Support the development of business case activities as required.</p> <p>Develop guidance (e.g., information system security engineering guidance) and programming recommendations to ensure the integration of Trusted Systems Networks concepts and processes into the acquisition and maintenance of DoD information systems, enclaves, and services, including the purchase and integration of tactical communication commodities.</p> <p><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i></p> <p>The increase of +\$6.941 from FY 2022 to FY 2023 is due to additional modeling & simulation efforts to develop and test and spectrum measurement activities; validate and monitor the efficacy of the multiple systems Mode S IFF implementation; finalize Stage2/3 DoD/ FAA/NTIA Model and predecessor metrics; Develop 5G technology standards contributions and support continued analysis in the area of Public Safety Communications (PSC) including NextGen 911, FirstNet and Land Mobile Radio (LMR).</p>			
Accomplishments/Planned Programs Subtotals		20.994	13.132
D. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
E. Acquisition Strategy			
N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 7						R-1 Program Element (Number/Name) PE 0305199D8Z / <i>Net Centricity</i>				Project (Number/Name) 199 / <i>GIG Evaluation Facilities (GIG-EF) and GIG Enterprise-Wide Systems Engineering Advisory Activities</i>					
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Studies and Analysis	Various	Various : Various	24.734	4.747	Jul 2021	0.084	Mar 2022	0.128	Mar 2023	-		0.128	Continuing	Continuing	Continuing
Technical Engineering Services	Various	Various : Various	51.709	1.000	Jul 2021	6.273	Jul 2022	9.503	Jul 2023	-		9.503	Continuing	Continuing	Continuing
Subtotal			76.443	5.747		6.357		9.631		-		9.631	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Various	Various : Various	24.356	4.480	Jul 2021	6.090	Mar 2022	-		-		-	Continuing	Continuing	Continuing
Program Support	FFRDC	Various : Various	2.803	0.066	Jul 2021	-		-		-		-	-	-	-
Engineering Support	FFRDC	Various : Various	20.289	9.000	Jul 2012	0.685	Dec 2021	8.286	Mar 2023	-		8.286	Continuing	Continuing	Continuing
R&D Support	Various	Various : Various	6.633	1.701	Jul 2021	-		-		-		-	-	-	-
Subtotal			54.081	15.247		6.775		8.286		-		8.286	Continuing	Continuing	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			130.524	20.994		13.132		17.917		-		17.917	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0305199D8Z / <i>Net Centricity</i>	Project (Number/Name) 199 / <i>GIG Evaluation Facilities (GIG-EF) and GIG Enterprise-Wide Systems Engineering Advisory Activities</i>

R4; PE 0305199D8Z; Net Centricity					
	10/1/2022	10/1/2023	10/1/2024	10/1/2025	10/1/2026
FY2023 Program Execution					
FY2024 Program Execution					
FY2025 Program Execution					
FY2026 Program Execution					
FY2027 Program Execution					

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0305199D8Z / <i>Net Centricity</i>	Project (Number/Name) 199 / <i>GIG Evaluation Facilities (GIG-EF) and GIG Enterprise-Wide Systems Engineering Advisory Activities</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
*** SUBPROJECT TITLE ***				
FY 2022 Projected Execution	1	2021	4	2022
FY 2023 Projected Execution	1	2022	4	2023
FY 2024 Projected Execution	1	2023	4	2024
FY 2025 Projected Execution	1	2024	4	2025
FY 2026 Projected Execution	1	2025	4	2026
FY 2027 Projected Execution	1	2026	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)
0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development</i>	PE 0305245D8Z <i>I Intelligence Capabilities and Innovation Investments</i>

COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	0.000	60.000	4.575	-	4.575	0.000	0.000	0.000	0.000	0.000	64.575
245: <i>Intelligence Capabilities & Innovation Investments</i>	-	0.000	60.000	4.575	0.000	4.575	0.000	0.000	0.000	0.000	0.000	64.575

Note

New Start (Y/N): Y

A. Mission Description and Budget Item Justification

Classified

B. Program Change Summary (\$ in Millions)

	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	60.000	4.575	-	4.575
Total Adjustments	0.000	60.000	4.575	-	4.575
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	60.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Departmental Decision	-	-	4.575	-	4.575

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 245: *Intelligence Capabilities & Innovation Investments*

Congressional Add: *Classified*

Congressional Add Subtotals for Project: 245

Congressional Add Totals for all Projects

FY 2021	FY 2022
0.000	60.000
0.000	60.000
0.000	60.000

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 7					R-1 Program Element (Number/Name) PE 0305245D8Z / <i>Intelligence Capabilities and Innovation Investments</i>				Project (Number/Name) 245 / <i>Intelligence Capabilities & Innovation Investments</i>			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
245: <i>Intelligence Capabilities & Innovation Investments</i>	-	0.000	60.000	4.575	0.000	4.575	0.000	0.000	0.000	0.000	0.000	64.575
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification Classified												
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	
Title: Intelligence Capabilities & Innovation Investments/Airborne Object Identification and Management							0.000	0.000	4.575	0.000	4.575	
Description: Classified												
FY 2022 Plans: N/A												
FY 2023 Base Plans: Classified												
FY 2023 OCO Plans: N/A												
FY 2022 to FY 2023 Increase/Decrease Statement: Classified												
Accomplishments/Planned Programs Subtotals							0.000	0.000	4.575	0.000	4.575	
							FY 2021	FY 2022				
Congressional Add: Classified							0.000	60.000				
FY 2021 Accomplishments: N/A												
FY 2022 Plans: Classified												
Congressional Adds Subtotals							0.000	60.000				
C. Other Program Funding Summary (\$ in Millions) N/A												

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0305245D8Z / <i>Intelligence Capabilities and Innovation Investments</i>	Project (Number/Name) 245 / <i>Intelligence Capabilities & Innovation Investments</i>
C. Other Program Funding Summary (\$ in Millions)		
Remarks		
D. Acquisition Strategy		
The contracting strategy follows guidance outlined in the DoD 5000 series directives, Federal Acquisition Regulation (FAR), Defense Federal Acquisition Regulation (DFAR),		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0305245D8Z / <i>Intelligence Capabilities and Innovation Investments</i>	Project (Number/Name) 245 / <i>Intelligence Capabilities & Innovation Investments</i>
Remarks Classified		

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense										Date: April 2022			
Appropriation/Budget Activity					R-1 Program Element (Number/Name)					Project (Number/Name)			
0400 / 7					PE 0305245D8Z / Intelligence Capabilities and Innovation Investments					245 / Intelligence Capabilities & Innovation Investments			

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<i>Intelligence Capabilities & Innovation Investments</i>																												
Airborne Object Identification and Management.																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0305245D8Z / Intelligence Capabilities and Innovation Investments	Project (Number/Name) 245 / Intelligence Capabilities & Innovation Investments

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Intelligence Capabilities & Innovation Investments</i>				
Airborne Object Identification and Management.	3	2022	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0305387D8Z I <i>Homeland Defense Technology Transfer Program</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	23.759	2.140	1.273	1.864	-	1.864	1.869	1.869	1.868	1.868	-	-
387: <i>Homeland Defense Technology Transfer Program</i>	23.759	2.140	1.273	1.864	-	1.864	1.869	1.869	1.868	1.868	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

This program supports the Department's initiatives to Defend the Homeland, Build Sustainable and Long-Term, Advantage, and Taking Care of People.

The Homeland Defense Technology Transfer program ensures a successful and balanced transfer of dual-use technology equipment and information to first responders without impeding military readiness. Accelerates dual-use tech transfer to first responders, increases effectiveness of equipment transfers to first responders, and transfers technology through a transitional effort that has dual utility to improve homeland security and enhance public safety without degrading military readiness. The program meets the Congressional intent of Sec 1401 of the National Defense Authorization Act for 2003 (P.L. 107-314) and supports the National Defense Strategy through continuously delivering performance with affordability and speed as we change Departmental mindset, culture, and management systems.

The program consolidates and coordinates various military endeavors that pass technology and equipment to first responders. Works with a variety of DoD activities, interagency partners, and first responder organizations to ensure that dual-use military technology is expedited into the commercial sector for use by law enforcement, fire, and emergency medical service personnel. Works with the Military Departments and Defense Logistics Agency to ensure that appropriate excess military equipment is made available to the first responder community on an expedited basis. Fulfills Congressional intent to help improve public safety and enhance public security.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense				Date: April 2022		
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development		R-1 Program Element (Number/Name) PE 0305387D8Z I Homeland Defense Technology Transfer Program				
B. Program Change Summary (\$ in Millions)		FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget		2.188	1.273	0.000	-	0.000
Current President's Budget		2.140	1.273	1.864	-	1.864
Total Adjustments		-0.048	0.000	1.864	-	1.864
• Congressional General Reductions		-	-			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-	-			
• Congressional Adds		-	-			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-0.020	-			
• Adjustment to Budget Year		-0.028	-	1.864	-	1.864
Change Summary Explanation						
FY 2023 funding increase reflects the fact that the FY 2022 President’s Budget request did not include out-year funding.						
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2021	FY 2022	FY 2023
Title: Homeland Defense Technology Transfer Program				2.140	1.273	1.864
Description: Provide outreach through coordination and cooperation with inter-agency partners to provide dual-use technology and equipment to first responders. Ensure DoD components conduct Technology Transfer programs that are appropriate for the respective component. Provide information to stakeholders on equipment and technology use and availability.						
FY 2022 Plans:						
- Continue efforts in support of the first responder community.						
- Use a consortium of subject matter experts/governance councils to prioritize technology transfer requirements and expedite DoD dual-use technologies.						
- Continue program outreach activities and prioritize outreach to reflect efficiencies.						
- Enhance and expedite excess equipment transfer capabilities from service level divestiture efforts and overseas contingency operations.						
FY 2023 Plans:						
- Continue efforts in support of the first responder community.						
- Use a consortium of subject matter experts/governance councils to prioritize technology transfer requirements and expedite DoD dual-use technologies.						
- Continue program outreach activities and prioritize outreach to reflect efficiencies.						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 7: Operational Systems Development</i>		R-1 Program Element (Number/Name) PE 0305387D8Z I <i>Homeland Defense Technology Transfer Program</i>		
C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
- Enhance and expedite excess equipment transfer capabilities from service level divestiture efforts and overseas contingency operations.				
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> The FY 2023 increase is the result of re-phasing requirements from FY 2022 due to a prior year execution rates.				
Accomplishments/Planned Programs Subtotals		2.140	1.273	1.864
D. Other Program Funding Summary (\$ in Millions) N/A				
Remarks				
E. Acquisition Strategy N/A				

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 7						R-1 Program Element (Number/Name) PE 0305387D8Z / <i>Homeland Defense Technology Transfer Program</i>						Project (Number/Name) 387 / <i>Homeland Defense Technology Transfer Program</i>			
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Homeland Defense Transfer of Dual-use Technology Equipment	MIPR	Navy Commands : SPAWAR, NSWC, ONR	23.759	2.140		1.273		1.864		-		1.864	Continuing	Continuing	-
Subtotal			23.759	2.140		1.273		1.864		-		1.864	Continuing	Continuing	N/A
Remarks N/A															
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			23.759	2.140		1.273		1.864		-		1.864	Continuing	Continuing	N/A
Remarks N/A															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense										Date: April 2022			
Appropriation/Budget Activity					R-1 Program Element (Number/Name)					Project (Number/Name)			
0400 / 7					PE 0305387D8Z / Homeland Defense Technology Transfer Program					387 / Homeland Defense Technology Transfer Program			

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Technology Transfer																												
Homeland Defense Transfer of Dual-use Technology Equipment																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0305387D8Z / Homeland Defense Technology Transfer Program	Project (Number/Name) 387 / Homeland Defense Technology Transfer Program	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Technology Transfer				
Homeland Defense Transfer of Dual-use Technology Equipment	1	2021	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: Research, Development, Test & Evaluation, Defense-Wide I BA 8: Software and Digital Technology Pilot Programs					PE 0608648D8Z I Acquisition Visibility - Software Pilot Program							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	0.000	16.220	18.204	17.123	-	17.123	16.543	16.797	16.741	16.756	Continuing	Continuing
059: Acquisition Visibility	0.000	16.220	18.204	17.123	-	17.123	16.543	16.797	16.741	16.756	Continuing	Continuing

Note

New Start (Y/N): No

A. Mission Description and Budget Item Justification

The AV investment funds an agile software program to deliver the Department's authoritative acquisition data through NIPR and SIPR instances of the Defense Acquisition Visibility Environment (DAVE), provide data access and standards via the Acquisition Visibility Data Framework (AVDF), and accelerate the retirement of costly legacy systems. AV is an authoritative source for acquisition data inside the DoD and for Congress, GAO, and the Inspectors General for multiple Adaptive Acquisition Framework (AAF) Acquisition Pathways including all Acquisition Category (ACAT) I – IV programs, Middle Tier of Acquisition programs, as well as National Command, Control, and Communications covered programs. Planned efforts include support to the acquisition data strategy requirements of Section 836 of the NDAA for FY 2021 and data collection and sharing for additional AAF Pathways, to include Defense Business Systems and Software Acquisition. Multiple acquisition data collection and analysis platforms rely on AV Capabilities for authoritative acquisition data, including but not limited to: OSD Comptroller Advanced Analytics (ADVANA), OSD Cost Analysis and Program Evaluation (CAPE) Cost Assessment Data Enterprise, Air Force and Army Program Metrics and Reporting Tools, Navy Research, Development and Acquisition Information System, and the Earned Value Management Central Repository.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	16.838	18.307	0.000	-	0.000
Current President's Budget	16.220	18.204	17.123	-	17.123
Total Adjustments	-0.618	-0.103	17.123	-	17.123
• Congressional General Reductions	-	-0.103			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.618	-			
• Adjustments to Budget Year	-	-	17.123	-	17.123

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 8					R-1 Program Element (Number/Name) PE 0608648D8Z / Acquisition Visibility - Software Pilot Program				Project (Number/Name) 059 / Acquisition Visibility			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
059: Acquisition Visibility	0.000	16.220	18.204	17.123	-	17.123	16.543	16.797	16.741	16.756	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note New start (Y/N): No												
A. Mission Description and Budget Item Justification The AV investment funds an agile software program to deliver the Department’s authoritative acquisition data through NIPR and SIPR instances of the Defense Acquisition Visibility Environment (DAVE), provide data access and standards via the Acquisition Visibility Data Framework (AVDF), and accelerate the retirement of costly legacy systems. AV is an authoritative source for acquisition data inside the DoD and for Congress, GAO, and the Inspectors General for multiple Adaptive Acquisition Framework (AAF) Acquisition Pathways including all Acquisition Category (ACAT) I – IV programs, Middle Tier of Acquisition programs, as well as National Command, Control, and Communications covered programs. Planned efforts include support to the acquisition data strategy requirements of Section 836 of the NDAA for FY 2021 and data collection and sharing for additional AAF Pathways, to include Defense Business Systems and Software Acquisition. Multiple acquisition data collection and analysis platforms rely on AV Capabilities for authoritative acquisition data, including but not limited to: OSD Comptroller Advanced Analytics (ADVANA), OSD Cost Analysis and Program Evaluation (CAPE) Cost Assessment Data Enterprise, Air Force and Army Program Metrics and Reporting Tools, Navy Research, Development and Acquisition Information System, and the Earned Value Management Central Repository.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2021	FY 2022	FY 2023	
Title: Acquisition Visibility Operation & Maintenance Efforts									6.262	5.162	8.650	
Description: Acquisition Visibility delivers authoritative, reliable acquisition data to Congress and the Department to enable statutory reporting, executive decision making, and portfolio insight on over \$2 trillion in lifecycle funding across approximately 100 active ACAT I programs, as well as approximately 1,000 Acquisition Category (ACAT) II, III, and IV programs, National Command, Control, and Communications covered programs, and 90 Middle Tier of Acquisition (MTA) programs. Acquisition Framework; and 3) support the acquisition data requirements of Section 836 of the NDAA for FY 2021.												
FY 2022 Plans: • Upgrade DAVE system performance and align data collection to current law and policy for the AAF. • Provide acquisition data analyses and visualizations. • Maintain and enhance AIR. • Align the Acquisition Visibility Data Framework to reflect evolving AAF data requirements. • Support Section 836 of the NDAA for FY 2021 data strategy implementation.												
FY 2023 Plans:												

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022		
Appropriation/Budget Activity 0400 / 8	R-1 Program Element (Number/Name) PE 0608648D8Z / <i>Acquisition Visibility - Software Pilot Program</i>	Project (Number/Name) 059 / <i>Acquisition Visibility</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> • Develop, test, and deploy DAVE system performance and align data collection to law and policy for the AAF. • Provide acquisition data analyses and visualizations. • Maintain the Acquisition Information Repository. • Align the Acquisition Visibility Data Framework to reflect evolving AAF data requirements. <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2022 to FY 2023 increase reflects additional sustainment costs of the DAVE capability as new modules are delivered.</p>				
<p>Title: Acquisition Visibility RDT&E Efforts</p> <p>Description: As a BA-08 program, Acquisition Visibility's RDT&E-related investments develop and enhance software capabilities to enhance program and portfolio insight of the Department's acquisition programs for the Defense Acquisition Executive (DAE), Component Acquisition Executives (CAEs), Service Chiefs of Staff, Office of the Secretary of Defense (OSD) senior leaders, and OSD and Component analysts. The Defense Acquisition Visibility Environment (DAVE) is an authoritative source for acquisition data inside the DoD and for the Congress, GAO, and the Inspectors General for multiple Adaptive Acquisition Framework (AAF) Acquisition Pathways including all Acquisition Category (ACAT) I – IV programs, and Middle Tier of Acquisition programs with data for additional AAF pathway data in requirements planning.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> • Develop, test, and deploy new features and capabilities for additional AAF Pathways and the data needs requirements of Section 836. • Expand/mature DAVE data sharing with existing and new OSD and component acquisition data platforms. • Complete AVDF expansion as the official common, governed data framework for the AAF. <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> • Manage features and capabilities for additional AAF Pathways. • Continue expansion of a mature DAVE data sharing with existing and new OSD and component acquisition data platforms. <p>FY 2022 to FY 2023 Increase/Decrease Statement: Aqn Viz O&M efforts are increasing from \$5.162 to \$8.65 and Aqn Viz RDT&E efforts are decreasing from \$13.042 to \$8.473 due to a transition of delivered capabilities from development to sustainment. Then note the net decrease from 18.204 to 17.123 reflects an A&S leadership decision.</p>		9.958	13.042	8.473
Accomplishments/Planned Programs Subtotals		16.220	18.204	17.123
C. Other Program Funding Summary (\$ in Millions)				
N/A				

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 8	R-1 Program Element (Number/Name) PE 0608648D8Z / <i>Acquisition Visibility - Software Pilot Program</i>	Project (Number/Name) 059 / <i>Acquisition Visibility</i>
C. Other Program Funding Summary (\$ in Millions)		
Remarks		
D. Acquisition Strategy Capability development and sustainment is acquired through a combination of competed small-disadvantaged and small business contracts employing agile software development methodologies.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 8						R-1 Program Element (Number/Name) PE 0608648D8Z / Acquisition Visibility - Software Pilot Program					Project (Number/Name) 059 / Acquisition Visibility				
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Visibility Operation & Maintenance Efforts	Option/ FFP	Contractor : Contractor Facility	0.000	6.262	Jun 2021	5.162	Jun 2022	8.650	Jun 2023	-		8.650	Continuing	Continuing	-
Acquisition Visibility RDT&E Efforts	Option/ FFP	Contractor : Contractor Facility	0.000	9.958	Jun 2021	13.042	Jun 2022	8.473	Jun 2023	-		8.473	Continuing	Continuing	-
Subtotal			0.000	16.220		18.204		17.123		-		17.123	Continuing	Continuing	N/A
			Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	16.220		18.204		17.123		-		17.123	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 8						R-1 Program Element (Number/Name) PE 0608648D8Z / <i>Acquisition Visibility - Software Pilot Program</i>						Project (Number/Name) 059 / <i>Acquisition Visibility</i>			

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
DAVE Sustainment and Enhancement																												
APB MVP																												
SIPR Analytic Layer																												
Legacy Application Transition to DAVE																												
DAVE Enhancement Prototyping																												
SIPR DAVE Enhancement Prototyping																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 8	R-1 Program Element (Number/Name) PE 0608648D8Z / <i>Acquisition Visibility - Software Pilot Program</i>	Project (Number/Name) 059 / <i>Acquisition Visibility</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>DAVE Sustainment and Enhancement</i>				
APB MVP	1	2023	4	2023
SIPR Analytic Layer	1	2023	3	2023
Legacy Application Transition to DAVE	1	2022	1	2026
DAVE Enhancement Prototyping	1	2022	4	2027
SIPR DAVE Enhancement Prototyping	1	2022	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 8: Software and Digital Technology Pilot Programs</i>					PE 0608775D8Z I <i>Accelerate Procurement and Fielding of Innovative Technologies (APFIT)</i>							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	100.000	0.000	100.000	0.000	0.000	0.000	0.000	Continuing	Continuing
255: <i>Accelerate Procurement and Fielding of Innovative Technologies (APFIT)</i>	-	0.000	0.000	100.000	0.000	100.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

New Start (Y/N): No

To better align the mission and budget activity with the FY 2022 National Defense Authorization Act (NDAA) Section 834. Pilot program to accelerate the procurement and fielding of innovative technologies (APFIT Pilot Program), the funding should be appropriated in budget activity four (BA 4), and should not be in the BA-08 line for Software and Digital Technology pilots. The FY 2022 Enacted Budget provided \$100 million in Procurement funding for this effort. The Department has included in the President's Budget this \$100 million, and will follow Congressional intent as to whether the funding should be RDT&E BA-04 for Prototyping or Procurement funding in FY 2023.

A. Mission Description and Budget Item Justification

This pilot program funds the FY 2022 National Defense Authorization Act (NDAA) Section 834. Pilot program to accelerate the procurement and fielding of innovative technologies (APFIT Pilot Program). This effort will be a follow on to the FY 2022 Enacted Procurement funding of "\$100 million to establish this Agile Procurement Transition Pilot under the management of the Deputy Secretary of Defense in collaboration with the Vice Chairman of the Joint Chiefs of Staff and the Service Acquisition Officials, with the goal to aid the warfighter, to transition technologies from pilot programs, prototype projects, and research projects to scale to capability, software, or service acquisitions." (Link: https://docs.house.gov/bills/20220307/BILLS-117RCP35-JES-DIVISION-C_Part1.pdf#page=147)

According to Sec 834 of the FY 2022 NDAA, the APFIT program develops military capabilities that reduce acquisition or life-cycle costs; addresses technical risks; improves the timeliness and thoroughness of test and evaluation outcomes; and, rapidly implements technologies that directly support defense missions. APFIT project selection will be guided by the National Defense Strategy and the National Defense Science and Technology strategy. APFIT is a competitively and merit-based process with priority given to small businesses and nontraditional defense innovators. The program facilitates the rapid transition of these capabilities to the Services, Defense Agencies, and other transition partners, and provides procurement funding to companies that have proven militarily relevant prototypes for which the Services are working to plan for procurement.

In partnership with the Services, Joint Staff, Combatant Commands, and non-traditional partners, the APFIT program accelerates the delivery of the most promising innovative capabilities to the warfighter thereby allowing the Department to maintain its military technological advantage.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 8: Software and Digital Technology Pilot Programs</i>	R-1 Program Element (Number/Name) PE 0608775D8Z I <i>Accelerate Procurement and Fielding of Innovative Technologies (APFIT)</i>
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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	100.000	-	100.000
Total Adjustments	0.000	0.000	100.000	-	100.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Other DoD Priorities	-	-	100.000	-	100.000

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding

Funding is provided to establish a pilot program to accelerate the procurement and fielding of innovative technologies.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 8					R-1 Program Element (Number/Name) PE 0608775D8Z / Accelerate Procurement and Fielding of Innovative Technologies (AP FIT)				Project (Number/Name) 255 / Accelerate Procurement and Fielding of Innovative Technologies (APFIT)			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
255: Accelerate Procurement and Fielding of Innovative Technologies (APFIT)	-	0.000	0.000	100.000	0.000	100.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

New Start (Y/N): No

To better align the mission and budget activity with the FY 2022 National Defense Authorization Act (NDAA) Section 834. Pilot program to accelerate the procurement and fielding of innovative technologies (APFIT Pilot Program), the funding should be appropriated in budget activity four (BA 4), and should not be in the BA-08 line for Software and Digital Technology pilots. The FY 2022 Enacted Budget provided \$100 million in Procurement funding for this effort. The Department has included in the President's Budget this \$100 million, and will follow Congressional intent as to whether the funding should be RDT&E BA-04 for Prototyping or Procurement funding in FY 2023.

A. Mission Description and Budget Item Justification

This pilot program funds the FY 2022 National Defense Authorization Act (NDAA) Section 834. Pilot program to accelerate the procurement and fielding of innovative technologies (APFIT Pilot Program). This effort will be a follow on to the FY 2022 Enacted Procurement funding of "\$100 million to establish this Agile Procurement Transition Pilot under the management of the Deputy Secretary of Defense in collaboration with the Vice Chairman of the Joint Chiefs of Staff and the Service Acquisition Officials, with the goal to aid the warfighter, to transition technologies from pilot programs, prototype projects, and research projects to scale to capability, software, or service acquisitions." (Link: https://docs.house.gov/bills/20220307/BILLS-117RCP35-JES-DIVISION-C_Part1.pdf#page=147)

According to Sec 834 of the FY 2022 NDAA, the APFIT program develops military capabilities that reduce acquisition or life-cycle costs; addresses technical risks; improves the timeliness and thoroughness of test and evaluation outcomes; and, rapidly implements technologies that directly support defense missions. APFIT project selection will be guided by the National Defense Strategy and the National Defense Science and Technology strategy. APFIT is a competitively and merit-based process with priority given to small businesses and nontraditional defense innovators. The program facilitates the rapid transition of these capabilities to the Services, Defense Agencies, and other transition partners, and provides procurement funding to companies that have proven militarily relevant prototypes for which the Services are working to plan for procurement.

In partnership with the Services, Joint Staff, Combatant Commands, and non-traditional partners, the APFIT program accelerates the delivery of the most promising innovative capabilities to the warfighter thereby allowing the Department to maintain its military technological advantage.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 8	R-1 Program Element (Number/Name) PE 0608775D8Z / Accelerate Procurement and Fielding of Innovative Technologies (APFIT)	Project (Number/Name) 255 / Accelerate Procurement and Fielding of Innovative Technologies (APFIT)	

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>Title: Accelerate Procurement and Fielding of Innovative Technologies</p> <p>Description: This project funds development of military capabilities that reduce acquisition or life-cycle costs; addresses technical risks; improves the timeliness and thoroughness of test and evaluation outcomes; rapidly implements technologies that directly support defense; and supports transition of these capabilities to the warfighter.</p> <p>FY 2022 Plans: This pilot program funds the FY 2022 National Defense Authorization Act (NDAA) Section 834. Pilot program to accelerate the procurement and fielding of innovative technologies (APFIT Pilot Program). This effort will be a follow on to the FY 2022 Enacted Procurement funding of “\$100 million to establish this Agile Procurement Transition Pilot under the management of the Deputy Secretary of Defense in collaboration with the Vice Chairman of the Joint Chiefs of Staff and the Service Acquisition Officials, with the goal to aid the warfighter, to transition technologies from pilot programs, prototype projects, and research projects to scale to capability, software, or service acquisitions.”</p> <p>FY 2023 Base Plans: Per Congressional direction, this project plans to fund two to ten efforts (between \$10 to \$50 million each) with emphasis on innovation, risk reduction, test and evaluation, and accelerated procurement, fielding, and transition.</p> <p>FY 2023 OCO Plans: N/A</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: The increase of \$100 million funds the FY 2022 NDAA Section 834 requirements.</p>	0.000	0.000	100.000	0.000	100.000
Accomplishments/Planned Programs Subtotals	0.000	0.000	100.000	0.000	100.000

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 8	R-1 Program Element (Number/Name) PE 0608775D8Z / Accelerate Procurement and Fielding of Innovative Technologies (AP FIT)	Project (Number/Name) 255 / Accelerate Procurement and Fielding of Innovative Technologies (APFIT)

D. Acquisition Strategy

APFIT acquisition strategy includes contracts, cooperative agreements, other transaction authorities, and other DoD acquisition vehicles for rapid procurement and fielding.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022			
Appropriation/Budget Activity 0400 / 8						R-1 Program Element (Number/Name) PE 0608775D8Z I Accelerate Procurement and Fielding of Innovative Technologies (AP FIT)					Project (Number/Name) 255 I Accelerate Procurement and Fielding of Innovative Technologies (APFIT)				
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
VARIOUS	MIPR	VARIOUS : VARIOUS	-	-		-		65.000		-		65.000	Continuing	Continuing	-
Subtotal			-	-		-		65.000		-		65.000	Continuing	Continuing	N/A
Remarks TBD															
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
VARIOUS	MIPR	VARIOUS : VARIOUS	-	-		-		10.000		-		10.000	Continuing	Continuing	-
Subtotal			-	-		-		10.000		-		10.000	Continuing	Continuing	N/A
Remarks TBD															
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
VARIOUS	C/Various	VARIOUS : VARIOUS	-	-		-		20.000		-		20.000	Continuing	Continuing	-
Subtotal			-	-		-		20.000		-		20.000	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense												Date: April 2022		
Appropriation/Budget Activity 0400 / 8						R-1 Program Element (Number/Name) PE 0608775D8Z / Accelerate Procurement and Fielding of Innovative Technologies (APFIT)				Project (Number/Name) 255 / Accelerate Procurement and Fielding of Innovative Technologies (APFIT)				

Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
VARIOUS	MIPR	VARIOUS : VARIOUS	-	-		-		5.000		-		5.000	Continuing	Continuing	-
Subtotal			-	-		-		5.000		-		5.000	Continuing	Continuing	N/A

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-	-	100.000	-	100.000	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 8	R-1 Program Element (Number/Name) PE 0608775D8Z / Accelerate Procurement and Fielding of Innovative Technologies (AP FIT)	Project (Number/Name) 255 / Accelerate Procurement and Fielding of Innovative Technologies (APFIT)	

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proposal Selection																												
Proposal Submission (Solicitation)																												
Proposal Evaluation																												
Proposal Selection																												
Project Start																												
Project Development																												
Project Development, Integration, Testing and Evaluation																												
Project Field Test																												
Project Demonstration or Field Test																												
Project Transition																												
Project Fielding or Transition																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 8	R-1 Program Element (Number/Name) PE 0608775D8Z / Accelerate Procurement and Fielding of Innovative Technologies (APFIT)	Project (Number/Name) 255 / Accelerate Procurement and Fielding of Innovative Technologies (APFIT)	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proposal Selection				
Proposal Submission (Solicitation)	1	2023	1	2023
Proposal Evaluation	1	2023	2	2023
Proposal Selection	2	2023	2	2023
Project Start	2	2023	2	2023
Project Development				
Project Development, Integration, Testing and Evaluation	2	2023	3	2023
Project Field Test				
Project Demonstration or Field Test	3	2023	3	2023
Project Transition				
Project Fielding or Transition	4	2023	2	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense **Date:** April 2022

Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 8: Software and Digital Technology Pilot Programs					R-1 Program Element (Number/Name) PE 0308588D8Z / Algorithmic Warfare Cross Functional Teams - Software Pilot Program							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	0.000	229.943	275.352	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	505.295
925: Algorithmic Warfare Cross Functional Teams - Software Pilot Program	0.000	229.943	275.352	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	505.295

Note

New Start (Y/N): No

The Algorithmic Warfare Cross Functional Team (AWCFT) program decrease reflects the AWCFT transfer to various classified mission partners.

A. Mission Description and Budget Item Justification

The AWCFT (Project Maven) is the pathfinder artificial intelligence (AI) initiative for the DoD that accelerates the integration of AI into DoD systems to improve warfighting speed and lethality for the Joint Force. Maven deploys capabilities that complement human cognition by automating key tasks of object identification, characterization and tracking, and by deriving insights from large-scale data sets to create immediately actionable intelligence. Maven's AI architecture initially automated and augmented Processing, Exploitation and Dissemination (PED) of Full Motion Video (FMV) from Tactical Unmanned Aerial Vehicles (TUAVs). Maven additionally developed algorithms to Medium Altitude, High Altitude, and Wide Area Motion Imagery (WAMI) Intelligence and multiple other Surveillance, and Reconnaissance (ISR) platforms to support the National Defense Strategy (NDS). Maven includes AI tools used on Captured Enemy Material (CEM), Maritime, and Public Available Information (PAI) exploitation. Most military intelligence exploitation systems were designed pre-AI and require specialized integration and multiple individuals to control and then enable the insertion of algorithms into their software baseline. Maven developed a path forward to eliminate substantial costs and coordination among myriad legacy projects to instead use a single screen with multiple AI-enabled layers and tools. Maven increases the value of ISR, reduces human processing so analysts can multi-task and produce more intel, and it now detects, classifies, and tracks objects exponentially faster than a human. With FMV intel, for example, Maven detects/tracks persons, vehicles, and weapon systems. By combining AI detections, tracks, and insights onto a single screen, Maven created tools for deployment to help mission commanders, operations personnel, and intel analysts to unite their increased productivity in conducting military operations in every domain of warfare – air, land, sea, space, and cyberspace.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 8: Software and Digital Technology Pilot Programs</i>	R-1 Program Element (Number/Name) PE 0308588D8Z I <i>Algorithmic Warfare Cross Functional Teams - Software Pilot Program</i>
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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	229.943	247.452	0.000	-	0.000
Current President's Budget	229.943	275.352	0.000	-	0.000
Total Adjustments	0.000	27.900	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	27.900			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 925: *Algorithmic Warfare Cross Functional Teams - Software Pilot Program*

Congressional Add: *Ukraine Supplemental*

	FY 2021	FY 2022
	0.000	27.900
Congressional Add Subtotals for Project: 925	0.000	27.900
Congressional Add Totals for all Projects	0.000	27.900

Change Summary Explanation

The Algorithmic Warfare Cross Functional Team (AWCFT) FY 2022 program increase reflects Ukraine Supplemental.

The Algorithmic Warfare Cross Functional Team (AWCFT) FY 2023 program decrease reflects the AWCFT transfer to various classified mission partners.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
Appropriation/Budget Activity 0400 / 8					R-1 Program Element (Number/Name) PE 0308588D8Z / Algorithmic Warfare Cross Functional Teams - Software Pilot Program				Project (Number/Name) 925 / Algorithmic Warfare Cross Functional Teams - Software Pilot Program			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
925: Algorithmic Warfare Cross Functional Teams - Software Pilot Program	0.000	229.943	275.352	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	505.295
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project Maven rapidly fields AI to programs and systems that augment and automate PED for FMV of UAVs, Medium Altitude, High Altitude, WAMI ISR, commercial and military satellite imagery in support of the NDS peer/near peer competitor strategy. Aside from imagery, Maven also uses AI to exploit CEM, Maritime, and PAI. Maven's AI, deep learning, and computer vision algorithms and insights are developed for use in theater to detect, classify, and track objects within images (e.g., persons, vehicles, and weapons) as well as provide other insights, such as with CEM, text-based, and other projects. Maven algorithms are still in development in all its lines of effort. While Maven's algorithms advance to increase the intelligence value of ISR and reduce the human burden on analysts, Maven develops complementary software that both analysts and operations personnel use to rapidly react, effectively plan, and clearly communicate. Project Maven's development process requires continuous feedback and substantial changes to mature user interfaces, build AI harnesses to run algorithms, and build labeled data sets. As the underlying Maven systems continue to develop new tools for mission operations, Project Maven must constantly manage a shifting R&D budget in critical AI architecture that supports the rapid expansion of AI. These developments are expected to resolve into licensing or other COTS-based solutions. Currently agility is required to turn R&D mission successes into production for procurement and sustainment by Services, SOCOM and CCMDs. While Maven's applications are developing, near-term and future requirements become more identifiable. However, certain nascent lines of effort will continue to require modification and advancement. Maven plans for the process to create a more robust and refined set of requirements, albeit with substantial room to continue to invest in better AI training data and better algorithms for years to come. Budgeting flexibility is important to Maven because Maven applies R&D to integrate new tools with legacy systems. Most military intelligence exploitation systems were designed pre-AI and therefore require specialized integration to enable the insertion of algorithms into the software baseline. Maven funds multiple approaches for bridging these technology hurdles which provides for multiple pathways. Critical is testing and evaluation and user feedback. Maven's successes, however, have already been deemed mission critical and have transitioned to procurement efforts. Maven will transition the Project Maven AI Training Foundry (AITF) to a mission owner, and to transition Project Maven's AI-enabled mission command investments to Title 10 MIP Procurement paths in FY 2023.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
Title: Algorithmic Warfare Cross Functional Teams - Software Pilot Program	229.943	247.452	0.000
Description: Project Maven rapidly fields AI to programs and systems that augment and automate PED for FMV of UAVs, Medium Altitude, High Altitude, WAMI ISR, commercial and military satellite imagery in support of the NDS peer/near peer competitor strategy. Aside from imagery, Maven also uses AI to exploit CEM, Maritime, and PAI. Maven's AI, deep learning, and computer vision algorithms and insights are developed for use in theater to detect, classify, and track objects within images (e.g., persons, vehicles, and weapons) as well as provide other insights, such as with CEM, text-based, and other projects.			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 8	R-1 Program Element (Number/Name) PE 0308588D8Z / <i>Algorithmic Warfare Cross Functional Teams - Software Pilot Program</i>	Project (Number/Name) 925 / <i>Algorithmic Warfare Cross Functional Teams - Software Pilot Program</i>

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2021	FY 2022	FY 2023
<p>Maven algorithms are still in development in all its lines of effort. While Maven's algorithms advance to increase the intelligence value of ISR and reduce the human burden on analysts, Maven develops complementary software that both analysts and operations personnel use to rapidly react, effectively plan, and clearly communicate. Project Maven's development process requires continuous feedback and substantial changes to mature user interfaces, build AI harnesses to run algorithms, and build labeled data sets. As the underlying Maven systems continue to develop new tools for mission operations, Project Maven must constantly manage a shifting R&D budget in critical AI architecture that supports the rapid expansion of AI. In the future, these developments are expected to resolve into licensing or other COTS-based solutions. For now, agility is required to turn R&D mission successes into production for procurement and sustainment by Services, SOCOM and CCMDs. While Maven's applications are developing, near-term and future requirements become more identifiable. However, certain nascent lines of effort will continue to require modification and advancement. Maven plans for the process to create a more robust and refined set of requirements, albeit with substantial room to continue to invest in better AI training data and better algorithms for years to come. Separately, budgeting flexibility is important to Maven because Maven applies R&D to integrate news tools with legacy systems. Most military intelligence exploitation systems were designed pre-AI and therefore require specialized integration to enable the insertion of algorithms into the software baseline. Maven funds multiple approaches for bridging these technology hurdles which provides for multiple pathways. Critical is testing and evaluation and user feedback. Maven's successes, however, have already been deemed mission critical and have transitioned to procurement efforts. At this time, lines of effort continue to mature. Appropriation flexibility is critical to transitioning the current RDT&E funding of complex systems into licenses and requirements, purchasable by Services and COCOMs. To continue to deliver outstanding capability,</p> <p>FY 2022 Plans:</p> <p>Project Maven will begin the pre-transfer of activities supporting the transition of GEOINT and Non-GEOINT functions associated with Maven's AI Training Foundry (ATF) to mission owners. After a transition, Mission owners shall be required to provide the ATF core AI Enterprise Responsibilities to the Services and SOCOM for GEOINT and Non-Geoint functions. Project Maven will continue to prepare for direction to transition lines of effort to a program of record, Service, or Agency. Project Maven will transfer funding authorities to the transition partner and will concomitantly transfer production procurement obligations to the services and combatant commands. Project Maven will continue to rapidly conduct prototype sprints that field augmentation tools for GEOINT, such as for Medium Altitude, High Altitude, WAMI ISR and commercial and military satellite SAR and EO, and for Non-GEOINT lines of effort, namely CEM, Maritime, radar, and PAI. While these sprints incentivize competition among vendors, Maven also requires collaboration among vendors between separate sprints to accelerate successful vendors' development and deployment of AI capabilities across the Defense Intelligence Enterprise for the Joint Force. Project Maven will continue to use artificial intelligence, deep learning, and computer vision algorithms to detect, classify, and track objects, and will use other AI algorithms to bring AI deeper into the process of object detection, identification, and tracking at computer processing speeds versus human speeds. Incorporating these and other tools will reduce the human burden and provide efficient and effective exploration of data</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022	
Appropriation/Budget Activity 0400 / 8	R-1 Program Element (Number/Name) PE 0308588D8Z / <i>Algorithmic Warfare Cross Functional Teams - Software Pilot Program</i>	Project (Number/Name) 925 / <i>Algorithmic Warfare Cross Functional Teams - Software Pilot Program</i>	

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
to create multi-modal and correlated insights. Among other plans, Project Maven will continue to develop algorithms focused on combining tactical UAV Automatic Target Recognition and an operational PED environment for platforms and ground stations. Project Maven will continue to build capabilities that integrate AI and ML to create actionable intelligence, advanced decision-making, and user alerts. Additional details on lines of effort are available at a higher classification level. FY 2023 Plans: N/A FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 funding decrease reflects Departmental Decision to transfer AWCFT funds to mission partners.			
Accomplishments/Planned Programs Subtotals	229.943	247.452	0.000

	FY 2021	FY 2022
Congressional Add: Ukraine Supplemental FY 2021 Accomplishments: N/A FY 2022 Plans: Increase of funds to support Ukraine crises.	0.000	27.900
Congressional Adds Subtotals	0.000	27.900

C. Other Program Funding Summary (\$ in Millions)
 N/A

Remarks

D. Acquisition Strategy
 AWCFT's contracting strategy follows guidance outlined in the DoD 5000 series directives, Federal Acquisition Regulation (FAR), Defense Federal Acquisition Regulation (DFAR), and rapid prototyping policies and procedures available to cross-functional teams. Management uses project management tools, executive steering group and working group meetings to ensure that stated capabilities and performance criteria are delivered.

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