Department of Defense
Fiscal Year (FY) 2022 Budget Estimates

May 2021

Missile Defense Agency

Defense-Wide Justification Book Volume 2a of 5

Research, Development, Test & Evaluation, Defense-Wide

THIS PAGE INTENTIONALLY LEFT BLANK

Table of Volumes

Defense Advanced Research Projects Agency..... Volume 1

Missile Defense Agency..... Volume 2

Office of the Secretary Of Defense..... Volume 3

Chemical and Biological Defense Program.....Volume 4

Defense Contract Audit Agency..... Volume 5

Defense Contract Management Agency..... Volume 5

Defense Counterintelligence and Security Agency.....Volume 5

Defense Information Systems Agency.....Volume 5

Defense Logistics Agency.....Volume 5

Defense Security Cooperation Agency.....Volume 5

Defense Technical Information Center.....Volume 5

Defense Threat Reduction Agency.....Volume 5

DoD Human Resources Activity..... Volume 5

Operational Test and Evaluation, Defense..... Volume 5

Space Development Agency..... Volume 5

The Joint Staff..... Volume 5

United States Special Operations Command.....Volume 5

Washington Headquarters Services.....Volume 5

Volume 2a Table of Contents

Introduction and Explanation of Contents.....Volume 2a - v

Comptroller Exhibit R-1..... Volume 2a - vii

Program Element Table of Contents (by Budget Activity then Line Item Number).....Volume 2a - xvii

Program Element Table of Contents (Alphabetically by Program Element Title).....Volume 2a - xxi

MDA Overview.....Volume 2a - xxiii

MDA Appropriation Summary..... Volume 2a - xliii

Congressional Reporting Requirements.....Volume 2a - xlvii

Acronyms..... Volume 2a - xlix

Exhibit R-2s.....Volume 2a - 1

THIS PAGE INTENTIONALLY LEFT BLANK

Introduction & Explanation of Contents

The Department of Defense Fiscal Year (FY) 2022 Budget Estimates Submission RDT&E (Includes Procurement, O&M, and MILCON), Defense-wide Volume 2, Missile Defense Agency (MDA) justification materials consists of two books titled Volume 2a and 2b. Justification documents are provided in the books as listed below.

Volume 2a

- R-1 Comptroller Exhibit
- MDA FY 2022 Budget Estimate Overview
- MDA Appropriation Summary
- Acronyms
- RDT&E Exhibits in BA-03, BA-04, and BA-06

Volume 2b

- P-1 Comptroller Exhibit
- MDA Operations and Maintenance Exhibit
- MDA MILCON Exhibits
- MDA Procurement Exhibits

Footnotes

FY 2020 Actuals

Includes Division A, Title IX and X of the Consolidated Appropriations Act, 2020 (P.L. 116-93), Division F, Title IV and V from the Further Consolidated Appropriations Act, 2020 (P.L. 116-94) and the Coronavirus Aid, Relief, and Economic Security Act (P.L. 116-136).

FY 2021 Enacted

Includes Division C, Title IX and Division J, Title IV of the Consolidated Appropriations Act, 2021 (P.L. 116-260).

Department of Defense
FY 2022 President's Budget
Exhibit R-1 FY 2022 President's Budget
Total Obligational Authority
(Dollars in Thousands)

24 May 2021

Appropriation	FY 2020 Actual*	FY 2021 Enacted**	FY 2022 Request
Research, Development, Test & Eval, DW	8,142,356	7,855,485	7,161,181
Total Research, Development, Test & Evaluation	8,142,356	7,855,485	7,161,181

R-122BAS: FY 2022 President's Budget (Total Base Published Version), as of May 24, 2021 at 12:23:28
*Includes Division A, Title IX and X of the Consolidated Appropriations Act, 2020 (P.L. 116-93), Division F, Title IV and V from the Further Consolidated Appropriations Act, 2020 (P.L. 116-94) and the Coronavirus Aid, Relief, and Economic Security Act (P.L. 116-136).
** Includes Division C, Title IX and Division J, Title IV of the Consolidated Appropriations Act, 2021 (P.L. 116-260).

Department of Defense
FY 2022 President's Budget
Exhibit R-1 FY 2022 President's Budget
Total Obligational Authority
(Dollars in Thousands)

24 May 2021

Summary Recap of Budget Activities	FY 2020 Actual*	FY 2021 Enacted**	FY 2022 Request
Advanced Technology Development	86,337	95,492	37,266
Advanced Component Development & Prototypes	7,921,130	7,733,091	7,099,813
Management Support	134,889	26,902	24,102
Total Research, Development, Test & Evaluation	8,142,356	7,855,485	7,161,181

Summary Recap of FYDP Programs			
General Purpose Forces			2,323
Intelligence and Communications	11,109	1,148	1,142
Research and Development	7,928,826	7,631,223	6,825,627
Administration and Associated Activities	27,065	26,902	24,102
Space	175,356	196,212	307,987
Total Research, Development, Test & Evaluation	8,142,356	7,855,485	7,161,181

R-122BAS: FY 2022 President's Budget (Total Base Published Version), as of May 24, 2021 at 12:23:28
*Includes Division A, Title IX and X of the Consolidated Appropriations Act, 2020 (P.L. 116-93), Division F, Title IV and V from the Further Consolidated Appropriations Act, 2020 (P.L. 116-94) and the Coronavirus Aid, Relief, and Economic Security Act (P.L. 116-136).
** Includes Division C, Title IX and Division J, Title IV of the Consolidated Appropriations Act, 2021 (P.L. 116-260).

Defense-Wide
FY 2022 President's Budget
Exhibit R-1 FY 2022 President's Budget
Total Obligational Authority
(Dollars in Thousands)

24 May 2021

Summary Recap of Budget Activities	FY 2020 Actual*	FY 2021 Enacted**	FY 2022 Request
Advanced Technology Development	86,337	95,492	37,266
Advanced Component Development & Prototypes	7,921,130	7,733,091	7,099,813
Management Support	134,889	26,902	24,102
Total Research, Development, Test & Evaluation	8,142,356	7,855,485	7,161,181

Summary Recap of FYDP Programs			
General Purpose Forces			2,323
Intelligence and Communications	11,109	1,148	1,142
Research and Development	7,928,826	7,631,223	6,825,627
Administration and Associated Activities	27,065	26,902	24,102
Space	175,356	196,212	307,987
Total Research, Development, Test & Evaluation	8,142,356	7,855,485	7,161,181

R-122BAS: FY 2022 President's Budget (Total Base Published Version), as of May 24, 2021 at 12:23:28
*Includes Division A, Title IX and X of the Consolidated Appropriations Act, 2020 (P.L. 116-93), Division F, Title IV and V from the Further Consolidated Appropriations Act, 2020 (P.L. 116-94) and the Coronavirus Aid, Relief, and Economic Security Act (P.L. 116-136).
** Includes Division C, Title IX and Division J, Title IV of the Consolidated Appropriations Act, 2021 (P.L. 116-260).

Defense-Wide
FY 2022 President's Budget
Exhibit R-1 FY 2022 President's Budget
Total Obligational Authority
(Dollars in Thousands)

24 May 2021

Appropriation	FY 2020 Actual*	FY 2021 Enacted**	FY 2022 Request
Missile Defense Agency	8,142,356	7,855,485	7,161,181
Total Research, Development, Test & Evaluation	8,142,356	7,855,485	7,161,181

R-122BAS: FY 2022 President's Budget (Total Base Published Version), as of May 24, 2021 at 12:23:28
*Includes Division A, Title IX and X of the Consolidated Appropriations Act, 2020 (P.L. 116-93), Division F, Title IV and V from the Further Consolidated Appropriations Act, 2020 (P.L. 116-94) and the Coronavirus Aid, Relief, and Economic Security Act (P.L. 116-136).
** Includes Division C, Title IX and Division J, Title IV of the Consolidated Appropriations Act, 2021 (P.L. 116-260).

Defense-Wide
FY 2022 President's Budget
Exhibit R-1 FY 2022 President's Budget
Total Obligational Authority
(Dollars in Thousands)

24 May 2021

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

Line No	Program Element Number	Item	Act	FY 2020 Actual*	FY 2021 Enacted**	FY 2022 Request	Sec
32	0603176C	Advanced Concepts and Performance Assessment	03	45,852	49,410	15,800	U
33	0603180C	Advanced Research	03	27,166	35,024	21,466	U
41	0603294C	Common Kill Vehicle Technology	03	13,319	11,058		U
		Advanced Technology Development		86,337	95,492	37,266	
80	0603881C	Ballistic Missile Defense Terminal Defense Segment	04	295,312	312,317	277,949	U
81	0603882C	Ballistic Missile Defense Midcourse Defense Segment	04	1,275,414	1,219,261	745,144	U
83	0603884C	Ballistic Missile Defense Sensors	04	348,356	265,803	224,750	U
84	0603890C	BMD Enabling Programs	04	630,196	616,455	595,301	U
85	0603891C	Special Programs - MDA	04	504,031	390,216	413,374	U
86	0603892C	AEGIS BMD	04	722,582	877,336	732,512	U
87	0603896C	Ballistic Missile Defense Command and Control, Battle Management and Communicati	04	550,513	645,741	603,448	U
88	0603898C	Ballistic Missile Defense Joint Warfighter Support	04	51,095	49,560	50,594	U
89	0603904C	Missile Defense Integration & Operations Center (MDIOC)	04	54,783	55,356	52,403	U
90	0603906C	Regarding Trench	04	22,550	11,863	11,952	U
91	0603907C	Sea Based X-Band Radar (SBX)	04	137,604	118,318	147,241	U
92	0603913C	Israeli Cooperative Programs	04	300,000	300,000	300,000	U
93	0603914C	Ballistic Missile Defense Test	04	398,939	365,208	362,906	U
94	0603915C	Ballistic Missile Defense Targets	04	545,764	536,133	553,334	U
99	0604102C	Guam Defense Development	04			78,300	U

R-122BAS: FY 2022 President's Budget (Total Base Published Version), as of May 24, 2021 at 12:23:28
*Includes Division A, Title IX and X of the Consolidated Appropriations Act, 2020 (P.L. 116-93), Division F, Title IV and V from the Further Consolidated Appropriations Act, 2020 (P.L. 116-94) and the Coronavirus Aid, Relief, and Economic Security Act (P.L. 116-136).
** Includes Division C, Title IX and Division J, Title IV of the Consolidated Appropriations Act, 2021 (P.L. 116-260).

Defense-Wide
FY 2022 President's Budget
Exhibit R-1 FY 2022 President's Budget
Total Obligational Authority
(Dollars in Thousands)

24 May 2021

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

Line No	Program Element Number	Item	Act	FY 2020 Actual*	FY 2021 Enacted**	FY 2022 Request	Sec
100	0604115C	Technology Maturation Initiatives	04	259,465	107,389		U
103	0604181C	Hypersonic Defense	04	386,528	272,632	247,931	U
111	0604672C	Homeland Defense Radar - Hawaii (HDR-H)	04	181,569	133,000		U
112	0604673C	Pacific Discriminating Radar	04	2,921			U
115	0604873C	Long Range Discrimination Radar (LRDR)	04	131,135	138,317	133,335	U
116	0604874C	Improved Homeland Defense Interceptors	04	514,062	860,384	926,125	U
117	0604876C	Ballistic Missile Defense Terminal Defense Segment Test	04	24,771	1,000	32,697	U
118	0604878C	Aegis BMD Test	04	167,364	71,498	117,055	U
119	0604879C	Ballistic Missile Defense Sensor Test	04	96,082	64,245	77,428	U
120	0604880C	Land-Based SM-3 (LBSM3)	04	36,918	56,628	43,158	U
121	0604887C	Ballistic Missile Defense Midcourse Segment Test	04	96,711	67,071	61,424	U
122	0202057C	Safety Program Management	04			2,323	U
125	0305103C	Cyber Security Initiative	04	11,109	1,148	1,142	U
127	1206893C	Space Tracking & Surveillance System	04	35,469	34,144	15,176	U
128	1206895C	Ballistic Missile Defense System Space Programs	04	139,887	162,068	292,811	U
		Advanced Component Development & Prototypes		7,921,130	7,733,091	7,099,813	
168	0605502C	Small Business Innovation Research - MDA	06	107,824			U
199	0901598C	Management HQ - MDA	06	27,065	26,902	24,102	U
		Management Support		134,889	26,902	24,102	

R-122BAS: FY 2022 President's Budget (Total Base Published Version), as of May 24, 2021 at 12:23:28
*Includes Division A, Title IX and X of the Consolidated Appropriations Act, 2020 (P.L. 116-93), Division F, Title IV and V from the Further Consolidated Appropriations Act, 2020 (P.L. 116-94) and the Coronavirus Aid, Relief, and Economic Security Act (P.L. 116-136).
** Includes Division C, Title IX and Division J, Title IV of the Consolidated Appropriations Act, 2021 (P.L. 116-260).

Defense-Wide
FY 2022 President's Budget
Exhibit R-1 FY 2022 President's Budget
Total Obligational Authority
(Dollars in Thousands)

24 May 2021

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

Line No	Program Element Number	Item	Act	FY 2020 Actual*	FY 2021 Enacted**	FY 2022 Request	Sec
Total Research, Development, Test & Eval, DW				8,142,356	7,855,485	7,161,181	

R-122BAS: FY 2022 President's Budget (Total Base Published Version), as of May 24, 2021 at 12:23:28
*Includes Division A, Title IX and X of the Consolidated Appropriations Act, 2020 (P.L. 116-93), Division F, Title IV and V from the Further Consolidated Appropriations Act, 2020 (P.L. 116-94) and the Coronavirus Aid, Relief, and Economic Security Act (P.L. 116-136).
** Includes Division C, Title IX and Division J, Title IV of the Consolidated Appropriations Act, 2021 (P.L. 116-260).

Missile Defense Agency
FY 2022 President's Budget
Exhibit R-1 FY 2022 President's Budget
Total Obligational Authority
(Dollars in Thousands)

24 May 2021

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

Line No	Program Element Number	Item	Act	FY 2020 Actual*	FY 2021 Enacted**	FY 2022 Request	Sec
32	0603176C	Advanced Concepts and Performance Assessment	03	45,852	49,410	15,800	U
33	0603180C	Advanced Research	03	27,166	35,024	21,466	U
41	0603294C	Common Kill Vehicle Technology	03	13,319	11,058		U
		Advanced Technology Development		86,337	95,492	37,266	
80	0603881C	Ballistic Missile Defense Terminal Defense Segment	04	295,312	312,317	277,949	U
81	0603882C	Ballistic Missile Defense Midcourse Defense Segment	04	1,275,414	1,219,261	745,144	U
83	0603884C	Ballistic Missile Defense Sensors	04	348,356	265,803	224,750	U
84	0603890C	BMD Enabling Programs	04	630,196	616,455	595,301	U
85	0603891C	Special Programs - MDA	04	504,031	390,216	413,374	U
86	0603892C	AEGIS BMD	04	722,582	877,336	732,512	U
87	0603896C	Ballistic Missile Defense Command and Control, Battle Management and Communicati	04	550,513	645,741	603,448	U
88	0603898C	Ballistic Missile Defense Joint Warfighter Support	04	51,095	49,560	50,594	U
89	0603904C	Missile Defense Integration & Operations Center (MDIOC)	04	54,783	55,356	52,403	U
90	0603906C	Regarding Trench	04	22,550	11,863	11,952	U
91	0603907C	Sea Based X-Band Radar (SBX)	04	137,604	118,318	147,241	U
92	0603913C	Israeli Cooperative Programs	04	300,000	300,000	300,000	U
93	0603914C	Ballistic Missile Defense Test	04	398,939	365,208	362,906	U
94	0603915C	Ballistic Missile Defense Targets	04	545,764	536,133	553,334	U
99	0604102C	Guam Defense Development	04			78,300	U

R-122BAS: FY 2022 President's Budget (Total Base Published Version), as of May 24, 2021 at 12:23:28
*Includes Division A, Title IX and X of the Consolidated Appropriations Act, 2020 (P.L. 116-93), Division F, Title IV and V from the Further Consolidated Appropriations Act, 2020 (P.L. 116-94) and the Coronavirus Aid, Relief, and Economic Security Act (P.L. 116-136).
** Includes Division C, Title IX and Division J, Title IV of the Consolidated Appropriations Act, 2021 (P.L. 116-260).

Missile Defense Agency
FY 2022 President's Budget
Exhibit R-1 FY 2022 President's Budget
Total Obligational Authority
(Dollars in Thousands)

24 May 2021

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

Line No	Program Element Number	Item	Act	FY 2020 Actual*	FY 2021 Enacted**	FY 2022 Request	Sec
100	0604115C	Technology Maturation Initiatives	04	259,465	107,389		U
103	0604181C	Hypersonic Defense	04	386,528	272,632	247,931	U
111	0604672C	Homeland Defense Radar - Hawaii (HDR-H)	04	181,569	133,000		U
112	0604673C	Pacific Discriminating Radar	04	2,921			U
115	0604873C	Long Range Discrimination Radar (LRDR)	04	131,135	138,317	133,335	U
116	0604874C	Improved Homeland Defense Interceptors	04	514,062	860,384	926,125	U
117	0604876C	Ballistic Missile Defense Terminal Defense Segment Test	04	24,771	1,000	32,697	U
118	0604878C	Aegis BMD Test	04	167,364	71,498	117,055	U
119	0604879C	Ballistic Missile Defense Sensor Test	04	96,082	64,245	77,428	U
120	0604880C	Land-Based SM-3 (LBSM3)	04	36,918	56,628	43,158	U
121	0604887C	Ballistic Missile Defense Midcourse Segment Test	04	96,711	67,071	61,424	U
122	0202057C	Safety Program Management	04			2,323	U
125	0305103C	Cyber Security Initiative	04	11,109	1,148	1,142	U
127	1206893C	Space Tracking & Surveillance System	04	35,469	34,144	15,176	U
128	1206895C	Ballistic Missile Defense System Space Programs	04	139,887	162,068	292,811	U
		Advanced Component Development & Prototypes		7,921,130	7,733,091	7,099,813	
168	0605502C	Small Business Innovation Research - MDA	06	107,824			U
199	0901598C	Management HQ - MDA	06	27,065	26,902	24,102	U
		Management Support		134,889	26,902	24,102	

R-122BAS: FY 2022 President's Budget (Total Base Published Version), as of May 24, 2021 at 12:23:28
*Includes Division A, Title IX and X of the Consolidated Appropriations Act, 2020 (P.L. 116-93), Division F, Title IV and V from the Further Consolidated Appropriations Act, 2020 (P.L. 116-94) and the Coronavirus Aid, Relief, and Economic Security Act (P.L. 116-136).
** Includes Division C, Title IX and Division J, Title IV of the Consolidated Appropriations Act, 2021 (P.L. 116-260).

Missile Defense Agency
FY 2022 President's Budget
Exhibit R-1 FY 2022 President's Budget
Total Obligational Authority
(Dollars in Thousands)

24 May 2021

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

Line No	Program Element Number	Item	Act	FY 2020 Actual*	FY 2021 Enacted**	FY 2022 Request	Sec
Total Missile Defense Agency				8,142,356	7,855,485	7,161,181	

R-122BAS: FY 2022 President's Budget (Total Base Published Version), as of May 24, 2021 at 12:23:28
*Includes Division A, Title IX and X of the Consolidated Appropriations Act, 2020 (P.L. 116-93), Division F, Title IV and V from the Further Consolidated Appropriations Act, 2020 (P.L. 116-94) and the Coronavirus Aid, Relief, and Economic Security Act (P.L. 116-136).
** Includes Division C, Title IX and Division J, Title IV of the Consolidated Appropriations Act, 2021 (P.L. 116-260).

Program Element Table of Contents (by Budget Activity then Line Item Number)

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Line #	Budget Activity	Program Element Number	Program Element Title	Page
32	03	0603176C	Advanced Concepts and Performance Assessment	Volume 2a - 1
33	03	0603180C	Advanced Research	Volume 2a - 9
41	03	0603294C	Common Kill Vehicle Technology	Volume 2a - 15

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Line #	Budget Activity	Program Element Number	Program Element Title	Page
80	04	0603881C	Ballistic Missile Defense Terminal Defense Segment	Volume 2a - 21
81	04	0603882C	Ballistic Missile Defense Midcourse Defense Segment	Volume 2a - 57
83	04	0603884C	Ballistic Missile Defense Sensors	Volume 2a - 97
84	04	0603890C	BMD Enabling Programs	Volume 2a - 133
85	04	0603891C	Special Programs - MDA	Volume 2a - 245
86	04	0603892C	AEGIS BMD	Volume 2a - 247

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Line #	Budget Activity	Program Element Number	Program Element Title	Page
87	04	0603896C	Ballistic Missile Defense Command and Control, Battle Management & Communication	Volume 2a - 309
88	04	0603898C	Ballistic Missile Defense Joint Warfighter Support	Volume 2a - 363
89	04	0603904C	Missile Defense Integration and Operations Center (MDIOC)	Volume 2a - 397
90	04	0603906C	Regarding Trench	Volume 2a - 421
91	04	0603907C	Sea Based X-Band Radar (SBX)	Volume 2a - 423
92	04	0603913C	Israeli Cooperative Programs	Volume 2a - 439
93	04	0603914C	Ballistic Missile Defense Test	Volume 2a - 453
94	04	0603915C	Ballistic Missile Defense Targets	Volume 2a - 485
99	04	0604102C	Guam Defense Development	Volume 2a - 527
100	04	0604115C	Technology Maturation Initiatives	Volume 2a - 535
103	04	0604181C	Hypersonic Defense	Volume 2a - 569
111	04	0604672C	Homeland Defense Radar-Hawaii	Volume 2a - 591
112	04	0604673C	Pacific Discriminating Radar	Volume 2a - 605
115	04	0604873C	Long Range Discrimination Radar (LRDR)	Volume 2a - 617
116	04	0604874C	Improved Homeland Defense Interceptors	Volume 2a - 633
117	04	0604876C	Ballistic Missile Defense Terminal Defense Segment Test	Volume 2a - 661
118	04	0604878C	Aegis BMD Test	Volume 2a - 675
119	04	0604879C	Ballistic Missile Defense Sensor Test	Volume 2a - 703

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Line #	Budget Activity	Program Element Number	Program Element Title	Page
120	04	0604880C	Land Based SM-3 (LBSM3)	Volume 2a - 719
121	04	0604887C	Ballistic Missile Defense Midcourse Defense Segment Test	Volume 2a - 741
122	04	0202057C	Safety Program Management	Volume 2a - 761
125	04	0305103C	Cyber Security Initiative	Volume 2a - 767
127	04	1206893C	Space Tracking and Surveillance System	Volume 2a - 773
128	04	1206895C	Ballistic Missile Defense System Space Programs	Volume 2a - 793

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Line #	Budget Activity	Program Element Number	Program Element Title	Page
168	06	0605502C	Small Business Innovation Research - MDA	Volume 2a - 827
199	06	0901598C	Management HQ - MDA	Volume 2a - 831

THIS PAGE INTENTIONALLY LEFT BLANK

Program Element Table of Contents (Alphabetically by Program Element Title)

Program Element Title	Program Element Number	Line #	BA	Page
AEGIS BMD	0603892C	86	04	Volume 2a - 247
Advanced Concepts and Performance Assessment	0603176C	32	03	Volume 2a - 1
Advanced Research	0603180C	33	03	Volume 2a - 9
Aegis BMD Test	0604878C	118	04	Volume 2a - 675
BMD Enabling Programs	0603890C	84	04	Volume 2a - 133
Ballistic Missile Defense Command and Control, Battle Management & Communication	0603896C	87	04	Volume 2a - 309
Ballistic Missile Defense Joint Warfighter Support	0603898C	88	04	Volume 2a - 363
Ballistic Missile Defense Midcourse Defense Segment	0603882C	81	04	Volume 2a - 57
Ballistic Missile Defense Midcourse Defense Segment Test	0604887C	121	04	Volume 2a - 741
Ballistic Missile Defense Sensor Test	0604879C	119	04	Volume 2a - 703
Ballistic Missile Defense Sensors	0603884C	83	04	Volume 2a - 97
Ballistic Missile Defense System Space Programs	1206895C	128	04	Volume 2a - 793
Ballistic Missile Defense Targets	0603915C	94	04	Volume 2a - 485
Ballistic Missile Defense Terminal Defense Segment	0603881C	80	04	Volume 2a - 21
Ballistic Missile Defense Terminal Defense Segment Test	0604876C	117	04	Volume 2a - 661
Ballistic Missile Defense Test	0603914C	93	04	Volume 2a - 453

Program Element Title	Program Element Number	Line #	BA	Page
Common Kill Vehicle Technology	0603294C	41	03	Volume 2a - 15
Cyber Security Initiative	0305103C	125	04	Volume 2a - 767
Guam Defense Development	0604102C	99	04	Volume 2a - 527
Homeland Defense Radar-Hawaii	0604672C	111	04	Volume 2a - 591
Hypersonic Defense	0604181C	103	04	Volume 2a - 569
Improved Homeland Defense Interceptors	0604874C	116	04	Volume 2a - 633
Israeli Cooperative Programs	0603913C	92	04	Volume 2a - 439
Land Based SM-3 (LBSM3)	0604880C	120	04	Volume 2a - 719
Long Range Discrimination Radar (LRDR)	0604873C	115	04	Volume 2a - 617
Management HQ - MDA	0901598C	199	06	Volume 2a - 831
Missile Defense Integration and Operations Center (MDIOC)	0603904C	89	04	Volume 2a - 397
Pacific Discriminating Radar	0604673C	112	04	Volume 2a - 605
Regarding Trench	0603906C	90	04	Volume 2a - 421
Safety Program Management	0202057C	122	04	Volume 2a - 761
Sea Based X-Band Radar (SBX)	0603907C	91	04	Volume 2a - 423
Small Business Innovation Research - MDA	0605502C	168	06	Volume 2a - 827
Space Tracking and Surveillance System	1206893C	127	04	Volume 2a - 773
Special Programs - MDA	0603891C	85	04	Volume 2a - 245
Technology Maturation Initiatives	0604115C	100	04	Volume 2a - 535

Missile Defense Agency

Fiscal Year (FY) 2022

Budget Estimates

OVERVIEW

Approved for Public Release

MDA Overview 21-C0447

Volume 2a 21-C0454

Volume 2b 21-C-0446

Mission

The Missile Defense Agency (MDA) mission is "to develop and deploy a layered Missile Defense System to defend the United States, its deployed forces, allies, and friends from missile attacks in all phases of flight." MDA's budget request for Fiscal Year (FY) 2022 is $8.917 billion. MDA's FY 2022 budget will continue the development, rigorous testing and fielding of reliable, increasingly capable, state-of-the-art defenses for the United States, our deployed forces, and the forces and territories of our allies and partners against current and projected missile threats. Building on the strategy to defend the Nation, the Agency's foundations for missile defense are:

1) Operations and Readiness;
2) Production and Fielding,
3) Development and Technology.

MDA will continue to collaborate closely with Combatant Commanders and the Services to support current and future needs for missile defense capabilities. MDA and these key stakeholders leverage the existing all-domain MDS to develop integrated architectures and capabilities to counter not only ballistic missiles but also hypersonic and cruise missile threats. This budget request maintains operational missile defense capacity and capabilities for existing homeland and regional defense forces and continues to increase interceptor inventory while improving maturation of defensive technologies, existing sensors, Command and Control, Battle Management and Communications (C2BMC) system, and kill vehicle capabilities to address evolving threats.

MDA's President's Budget submission aligns with longstanding U.S. missile defense policy, which encourages the development and deployment of homeland missile defenses to address ballistic missile threats from rogue states such as North Korea and Iran. The United States is not developing or deploying missile defense capabilities designed to counter nuclear intercontinental-range missile threats from near-peers Russia and China.

To address regional threats, U.S. missile defense policy promotes the development and deployment of missile defense capabilities against the full range of regional missile threats from any source, to include rogue states and near-peer adversaries. In response to increasing threats in the Indo-Pacific region, MDA is supporting efforts to improve the warfighter's capability to defend Guam against regional cruise, ballistic, and hypersonic missiles. FY 2022 funding will support detailed engineering and analysis activities to develop and deploy an effective defensive architecture solution.

The Ground-Based Midcourse Defense (GMD) system, currently defends the U.S. against long-range ballistic missile threats from rogue states. Initially fielded in the early 2000s, the GMD system is undergoing a service life extension program and will be improved with the addition of the Next Generation Interceptor (NGI) starting in 2028.

MDA continues to make significant progress in cybersecurity by incorporating system-level requirements into system specifications and then implementing rigorous evaluation-based testing and assessments. We established a Defensive Cyberspace Operations organization, augmenting the workforce with certified cyber teams to evaluate the effectiveness of cyber capabilities and implement structures to enhance our cybersecurity posture. MDA is building cybersecurity into next-generation software processes by leveraging proven secure software development, security, and operations, and establishing continuous integration. We are also closely collaborating with our Defense Industrial Base partners to protect MDA and supplier information. MDA defends its networks against the advanced persistent cyber threat through its Cybersecurity Emergency Response Team. This team provides 24/7 network monitoring and defense of over 24 thousand network devices and continues to expand its breadth of coverage. MDA has continuously supported DoD cyberspace efforts by providing timely MDA situational awareness.

Missile Threat

U.S. adversaries are developing more capable ballistic, hypersonic, and cruise missiles, systems with global reach, increased speed and maneuverability, greater accuracy, and improved countermeasures. North Korea is developing long-range ballistic missiles that threaten the United States and our allies in the Indo-Pacific region while also testing shorter-range maneuvering missiles. Iran continues to develop more sophisticated missiles with improved accuracy, range, and lethality. Iran is also fielding an array of increasingly accurate short- and medium-range ballistic missiles. Iran has demonstrated the ability to combine ballistic or cruise missiles with unmanned aerial vehicles in complex attacks. Russia and China operate advanced ballistic and cruise missile forces, and they are developing and deploying advanced air- and surface-launched long-range cruise and hypersonic missile capabilities. Regional hypersonic missiles are being developed specifically to challenge U.S. missile defense capabilities. These threats are capable of holding deployed U.S. forces, allies, and partners at risk. Hypersonic glide vehicles delivered by ballistic missile boosters will pose new challenges to our missile defenses. Moreover, U.S. adversaries and strategic competitors will increasingly use cyber capabilities to seek political, economic, and military advantage over the United States and its allies and partners, including intelligence gathering on and disruption of U.S. missile defense systems.

Major Program Element Highlights

The following discussion summarizes the highlights of major Program Elements (PE) aligned to five broad categories: 1) Detect and Control, 2) Engage, 3) Technology, 4) MDS Testing, and 5) International. First, the system detects the launch of the threat missile and tracks it maintaining birth to death custody of the threat. Based on this track, the Command and Control system, or C2BMC, tasks the appropriate weapon systems to engage the threat. The weapon systems develop fire control solutions so that our interceptors engage and negate the threat. MDA's C2BMC is the all-domain backbone that enables detect, control, engage sequence.

Note: The following discussion does not necessarily examine all funding or activities included within each Program Element (PE).

I. Detect and Control

MDA supports and upgrades C2BMC capability across 18 time zones with hardened networks supporting U.S. Northern Command (USNORTHCOM), U.S. Indo-Pacific Command (USINDOPACOM), U.S. European Command (USEUCOM), U.S. Central Command (USCENTCOM), U.S. Space Command (USSPACECOM) and Missile Defense Radars for missile defense and space domain awareness mission support. The budget request includes:

- **Command and Control, Battle Management and Communication (C2BMC) *(PE 0603896C)*.** MDA is requesting $603.4 million in FY 2022 for C2BMC. C2BMC provides persistent acquisition, tracking, cueing, discrimination, and fire-control quality data to Aegis, GMD, THAAD, Patriot, Space C2 and coalition partners to support homeland and regional defense. MDA's C2BMC capabilities support Warfighter needs across the globe by providing the Combatant Commander with management and user nodes, the Ballistic Missile Defense (BMD) planner, situational awareness tools, and battle management capability. These tools support global missile defense situational awareness, coalition operations, weapons release authority for homeland defense, and to control and task a variety of MDS radars. C2BMC operators and maintainers deploy to some of the world's most threatening regions and continue to provide around-the-clock support to the local commanders.
  - In FY 2022, MDA will sustain the C2BMC fielded capability (Spiral 8.2-3 initially and transition to Spiral 8.2-5) in USNORTHCOM, USINDOPACOM, USEUCOM, USCENTCOM, and USSPACECOM Areas of Responsibilities, which includes the following capability: Mobile Sensor Phase 1 and BMDS Overhead Persistent Infra-Red Architecture (BOA) 6.1 track data to the MDS; support for Space Domain Awareness with Hardened Army Navy/Transportable Radar Surveillance (AN/TPY-2) radars, and the Long Range Discrimination Radar (LRDR); Aegis Engage-on-Remote, which can provide a seven-fold increase in defended area coverage when compared to individual weapon system organic capability; provide Protected Anti-Scintillation Anti-Jam Net-Centric support for continued communications between sites and Combatant Commands (CCMD).

- MDA will field Spiral 8.2-5, which integrates LRDR and BOA 7.0 into the MDS for support of homeland defense. This spiral provides initial situational awareness and tracking capability for hypersonic threats; significantly expands Homeland Defense for NORTHCOM and Space Domain Awareness capabilities for the SPAECOM with LRDR; integrates the U.S. Army's Integrated Air and Missile Defense (IAMD) Battle Command System (IBCS) into the MDS; integrates on-orbit Space-based Kill Assessment (SKA) sensors providing initial hit assessment capability for homeland defense; and develops initial MDS System Track for homeland defense.
- MDA continues to improve the MDS to keep pace with emerging threats worldwide by investing in the development, integration, and testing of advanced algorithms to improve track and discrimination capabilities and enhance the use of space-based sensor data, using the BOA.
- C2BMC will start capability development to support efforts to provide the Warfighter with the capability to employ layered missile defense architectures with auto-engagement coordination logic for multiple weapon systems (GMD, Aegis, and THAAD).
- Finally, MDA will continue to update its architecture to increase cybersecurity by assessing the risk of C2BMC architecture against possible attack. C2BMC capabilities will be involved in multi-agency cyber-focused tests and assessments planned in FY 2022 to identify and correct cyber vulnerabilities.

- **Sea-Based X-band (SBX) Radar *(PE 0603907C)*.** MDA is requesting $147.2 million in FY 2022 for the SBX. SBX is an advanced sea-mobile radar that provides precision midcourse tracking and discrimination capabilities. The SBX participates in flight tests to demonstrate discrimination and debris mitigation improvements, as well as operations for homeland defense. The budget request includes funds to extend time at sea and conduct contingency operations for defense of the homeland. Specifically, SBX plans approximately 320 days at sea and 45 days for in-port maintenance in FY 2022, and average 300 days at sea annually from FY 2022-2026. The budget request also continues the x86 X-Band Radar (XBR) superdome replacement to address obsolete equipment and increase the XBR processing capabilities. The new processors and software will be fielded in FY 2022.

- **Long Range Discrimination Radar (LRDR) *(PE 0604873C)*.** MDA is requesting $133.3 million in FY 2022 for the LRDR, which will provide persistent long-range midcourse discrimination, precision tracking and hit assessment to support the GMD capability against long-range missile threats from the Pacific theater. LRDR's improved discrimination capability in the Pacific architecture increases the defensive capacity of the homeland defense interceptor inventory by enabling conservation of GBIs. LRDR includes threat discrimination improvements to enhance MDS effectiveness against the evolving threat. LRDR also supports other mission areas, including Space Domain Awareness. Initial fielding of the LRDR is planned for FY 2022 leading to Operational Acceptance by the Warfighter in FY 2023 timeframe. MDA's request includes funding for software Independent Verification and Validation, Modeling and Simulation (M&S) efforts, and development of software for tracking and discrimination improvements and refined space intelligence data.
- **Radar Program Maintenance and Sustainment** supports both homeland and regional defense missions. MDA is requesting $190.7 million in FY 2022 to sustain AN/TPY-2 radars, Cobra Dane, and Upgraded Early Warning Radars (UEWR). The Services and CCMDs, with logistical support from MDA, operate AN/TPY-2 (Forward Based Mode) radars in Japan (two radars), Israel, Turkey, and USCENTCOM. MDA continues to support the AN/TPY-2 radar (Terminal Mode) as part of forward-deployed THAAD batteries in the USINDOPACOM area of responsibility.
- **Radar Procurement.** MDA is requesting $2.7 million to procure an AN/TPY-2 Cooling Equipment Unit (CEU) modernization kit, which will bring the CEUs into a common, more reliable configuration over time.
- **Sensors (*PE 0603884C*).** MDA is requesting $224.8 million in FY 2022 to provide software updates for the AN/TPY-2, COBRA DANE, SBX, and UEWR radars to counter evolving threats, and to develop future radar capabilities through system engineering, software development, and testing. MDA is investing in a robust sensor architecture that supports MDS weapons systems to provide highly accurate midcourse tracking, discrimination and battle damage assessment for homeland missile defense. The request includes funding for the development of advanced discrimination algorithms for the AN/TPY-2 and SBX radars to counter

evolving threats. The improvements will develop and field integrated capabilities to improve the MDS ability to identify lethal and non-lethal objects.

- **Sensors Test *(PE 0604879C)*.** MDA is requesting $77.4 million in FY 2022 for Sensors testing. This includes planning, analysis and execution of MDS flight test events, including pre- and post-test efforts such as Digital and Hardware-in-the-Loop (HWIL) System Pre-Mission Tests and System Post-Flight Reconstruction. Sensor tests also provide planning, analysis and execution in accordance with the ground test Concept of Operations for MDS-level ground tests identified in the Integrated Master Test Plan (IMTP), as well as support to HWIL infrastructure.
- **Space Program *(PE 1206895C)*.** MDA is requesting $292.8 million in FY 2022 for Missile Defense Space Programs. This request funds the Spacebased Kill Assessment (SKA) project, which uses a network of fast-rate infrared sensors hosted on commercial satellites to deliver a hit and kill assessment capability for homeland defense. As MDA's pathfinder program to host military payloads on commercial satellites, SKA proved that commercial hosting can deploy assets on orbit quickly – around half the time of the average traditional space program, and at significant cost savings. SKA sensors on orbit today have participated successfully in a variety of MDA flight tests and engineering activities, to include the collection of data for hit assessment in Flight Test Ground-based Midcourse Defense-11 (FTG-11). In FY 2022, MDA will complete development of the operational hit assessment software code, continue developing kill assessment algorithms and threat models, and finalize integration of the SKA operational interface in order to add the SKA capability to the operational all-domain MDS. This request also funds the Hypersonic and Ballistic Tracking Space Sensor (HBTSS) development. MDA is collaborating with the U.S. Space Force, under the leadership of the Chief of Space Operations, and the Space Development Agency to deploy HBTSS as an element within the larger Overhead Persistent Infrared Enterprise Architecture. During HBTSS Phase IIb acquisition, HBTSS will continue with prototype payload design informed by two Critical Design Reviews (CDRs). In FY2022, HBTSS will continue tracking algorithm maturation and commence flight infrared sensor payload assembly and integration. HBTSS will also acquire launch services through United States Space Force's National Security Space Launch (NSSL) to support the planned launch date in FY 2023. Development and

implementation of the HBTSS Ground System to support satellite operations and testing will continue as well in FY 2022 to meet the planned FY 2023 launch.

- **Space Tracking and Surveillance System (STSS)** satellite operations and sustainment ***(PE 1206893C)***. MDA is requesting $15.2 million in FY 2022 to passivate the STSS satellites, bringing to conclusion an extremely successful program that demonstrated the necessity of an on-orbit detection and tracking capability for the MDS. Funds requested will provide for the safe passivation of the STSS demonstration satellites and close-out of the program through FY 2022.

II. Engage

MDA remains committed to developing, delivering, sustaining, and improving the nation's missile defenses. The FY 2022 budget request continues to resource and improve U.S. homeland missile defenses designed to counter ballistic missile threats from rogue states. In addition, the FY 2022 budget request continues to resource and build integrated missile defenses that are interoperable with systems deployed by international partners to protect our deployed forces, allies and international partners against ballistic, cruise, and hypersonic missile threats. GMD continues to serve as the backbone of our homeland missile defense. Initially fielded in the early 2000s, the GMD system is undergoing a life extension program and will be improved with the addition of the NGI starting in 2028. At the same time, MDA is assessing alternatives to augment GMD and provide additional homeland defense capability, including the potential of leveraging residual capability inherent in existing regional defense systems to defend against ICBM-range threats from rogue states. For regional defense of our deployed forces, allies, partners, and friends, the Aegis Sea-Based Weapon System, and THAAD continue to be key components. The budget request includes:

- **Ground-Based Midcourse Defense (GMD) *(PE 0603882C)*.** MDA is requesting $745.1 million in FY 2022 for GMD. The GMD element of the MDS provides CCMDs with a continuously available (24 hours a day, 7 days a week, 365 days a year) capability to defend the homeland against limited ICBM attacks during the midcourse phase of flight. The GMD capability consists of GBI, GMD Fire Control system (GFC), GMD Communication Network (GCN), In-Flight Interceptor Communications System Data Terminals (IDTs) and ground Launch Support Systems (LSS). MDA plans to upgrade and replace ground system

infrastructure and fire control/kill vehicle (KV) software to improve the reliability, capability, and cybersecurity resiliency of the GMD weapon system. MDA will continue developing, testing and fielding of a Ground System 8 software build that provides a selectable 2/3 stage capability for employment of GBIs, improves discrimination, integrates LRDR with GMD Fire Control, improves Cybersecurity posture, and supports GCN and IDT modernization. MDA will complete the acquisition of five boosters which will ensure the number of fielded GBIs does not decrease through the FYDP. MDA will continue development, testing and integration of the Fort Greely, Alaska Missile Field 4 and a new LSS with GMD Ground Systems to increase silo capacity and modernize Silo Interface Vault equipment in existing silos.

- **Improved Homeland Defense Interceptors *(PE 0604874C).*** MDA is requesting $926.1 million in FY 2022 for the NGI. The NGI development allows trades between boost vehicle and payload, improves system survivability, and performance against projected threats from rogue states. MDA intends to leverage the valuable technical information developed under Redesigned Kill Vehicle (RKV) and Multi-Object Kill Vehicle (MOKV) to positively influence future designs. On 24 March 2021, the Department of Defense awarded two contracts in support of the Next Generation Interceptor (NGI) program. The request will fund initial requirements analysis, design, development, prototyping, integration and relevant environment testing to mature the booster, payload, sensor(s), and design-specific critical technologies and technology elements.
- **Ground-Based Midcourse Defense Test *(PE 0604887C).*** MDA is requesting $61.4 million in FY 2022 for the GMD test program, which supports the Integrated Master Test Plan (IMTP). MDA is developing the capability for GMD to launch GBIs in a 2-stage mode in addition to the existing 3-stage mode. This approach will provide additional homeland defense performance by increasing battle-space capability through shorter engagement times. The 2-stage booster capability is scheduled to be flight tested in Ground-based Midcourse Defense Booster Vehicle Test-03 (GM BVT-03) in FY 2021. Although no flight tests will be executed for the NGI until the 2027 timeframe, continued ground testing and cyber testing is an essential requirement to support this critical MDS capability.

- **GMD Maintenance and Sustainment**. MDA is requesting $156.6 million in FY 2022 for the Operation and Maintenance (O&M) of the GMD weapon system. In addition to operation, maintenance and sustainment of the GMD weapon system and operational and support facilities at Fort Greely, Alaska; Vandenberg AFB, California; Fort Drum, New York; Schreiver AFB, Colorado; and Erickson Air Station, Alaska, this request includes Warfighter training, war-games, and exercises to maintain readiness.

Aegis capitalizes on and evolves the existing United States Navy Aegis Weapon System (AWS) and Standard Missile (SM) infrastructures. Aegis provides a forward-deployable, mobile capability to detect and track ballistic missiles of all ranges, and has the ability to destroy short-range ballistic missiles (SRBMs) and medium-range ballistic missiles (MRBMs) in both the midcourse and terminal phases of flight and intermediate-range ballistic missiles (IRBMs) in the midcourse phase of flight. The FY 2022 budget request supports continued advancement of the Aegis Weapon System to counter growing and more complex threats, including improvements in system and missile reliability as well as increases in Aegis engagement capacity and lethality. MDA continues to support the European Phased Adaptive Approach (EPAA) as the U.S. contribution to the North Atlantic Treaty Organization's (NATO) missile defense capability, providing coverage and protection of NATO's European territory, populations, and forces against the increasing ballistic missile threat from outside the Euro-Atlantic region. Currently, there is an operational Aegis Ashore site located in Romania and another under construction in Poland. In FY 2022, MDA will begin efforts to improve missile defense capability for the defense of Guam.

- **Aegis *(PE 0603892C).*** MDA requests $732.5 million in FY 2022 for Aegis Missile Defense. The program includes the design, development, and integration of the Aegis Weapon System with the SM-3 Interceptor (SM-3 Block IB and Block IIA). This includes continued software spiral development to pace and defeat more complex threats in more complex operational environments, and the transition of the Kinetic Warhead common hardware to support initial deployment. MDA is strongly committed to maintaining and enhancing the Aegis Weapon System capability, in alignment with Navy requirements, to improve performance against ballistic missiles threats. Utilizing improved radar discrimination, Aegis will increase capability against longer

range and more sophisticated threats across three main weapon system product lines: BMD 5.1, BMD 4.2, and BMD 6.0. MDA continues to provide additional software capability development to upgrade Integrated Air and Missile Defense (IAMD) Baseline 9.C2 (BMD 5.1) in support of countering advanced threats and capabilities. MDA also continues software development for Aegis Baseline 5.4.1 (BMD 4.2) and the IAMD Baseline 10 (BMD 6.0). Both baselines bring enhanced weapon system functionality using more capable radars. BMD 4.2 is a joint effort with the U.S. Navy that refurbishes existing ship AN/SPY-1 radar arrays with the installation of antenna Low Noise Amplifiers (LNA) to provide increased radar sensitivity, discrimination improvements against an increased threat set. The BMD 6.0 computer upgrade will integrate MD capability with data provided by the Advanced Air and Missile Defense Radar (AMDR), also known as the AN/SPY-6, for enhanced engagement capability and increased raid capacity. Additionally, MDA continues upgrading the SM-3 Block IB hardware and software to leverage the capability of the SM-3 Block IIA. As part of the AEGIS request, MDA is requesting $99 million in FY 2022, to provide greater depth of defense as part of a layered MDS.

- **Land Based SM-3 *(0604880C).*** MDA is requesting $43.2 million in FY 2022 to modernize, develop, and test Aegis Ashore capability improvements at the Aegis Ashore Missile Defense Test Complex in Hawaii for implementation at operational sites. The funding also supports operations at the site in Romania and completion of construction at the site in Poland. In FY 2022 MDA will continue High-Altitude Electromagnetic Pulse Combat System hardening in Romania. Land Based SM-3 provides an Aegis Ashore exo-atmospheric defense against short to intermediate-range ballistic missile threats in the later stages of flight.
- **Aegis Testing *(PE 0604878C).*** MDA is requesting $117.1 million in FY 2022 for the Aegis test program, which supports the IMTP. The Aegis Flight Test Program supports comprehensive testing of Aegis components and demonstrates their interoperability with the MDS. Using accredited Modeling and Simulation (M&S), the ground test program provides the evidence required to transition the capability to the Operational Capacity Baseline. In November, 2020 MDA successfully conducted flight test (FTM-44) to demonstrate an Aegis SM-3 Block IIA capability against an ICBM-class threat using an SM-3 Block IIA missile

and the Aegis Weapon System. This test helped demonstrate the potential capability to augment our homeland defenses by "layering" different interceptor systems and leveraging engage-on-remote capabilities through the C2BMC network.

- **Defense of Guam *(PE 0604102C).*** MDA requests $78.3 million to assess systems to support the Defense of Guam. Funds support detailed threat and requirements analysis, systems engineering, trade studies, specifications updates and risk management in support of INDOPACOM stated needs. The Department is in the process of finalizing the details of this IAMD system. Architectures under consideration include some common elements.
- **Aegis Procurement.** MDA requests a total of $755.1 million in FY 2022 for Aegis procurement. This includes $647.4 million for procuring Aegis SM-3 missiles. MDA will procure 40 Aegis SM-3 Block IB missiles and 8 Aegis SM-3 Block IIA missiles in FY 2022. The request continues a five-year Multiyear Procurement for Aegis SM-3 Block IB missiles ending in FY 2023. The procurement budget also requests $81.8 million for Aegis Weapon Systems consisting of Aegis shipset equipment, software, and installation materials. The budget requests $25.9 million for installation of the combat system and combat structure adaptation at the Aegis Ashore site in Poland. Each missile variant can be used on Aegis ships and at the Aegis Ashore sites in Romania and Poland.
- **Defense of Guam Procurement.** MDA requests $40 million procurement for long lead items in FY 2022. MDA plans to begin procuring materials that are common to the architectures under consideration including components for fire control, radar technology, and common display processing equipment.
- **Aegis Maintenance and Sustainment.** MDA is requesting $68.3 million in FY 2022 in O&M funding. The Aegis program will perform missile recertification, repair efforts, and Ordnance Assessment/Surveillance. This funding also supports sustainment of MD Computer Programs, Ship Equipment, and Aegis Ashore Poland, as well as Fleet integration support.

Also key to missile defense capability is the Terminal High Altitude Area Defense (THAAD) weapon system. THAAD is a globally-transportable, ground-based missile defense system that is highly effective against short-, medium-, and limited intermediate-range

ballistic missile threats inside and outside the atmosphere in the terminal phase of flight. THAAD provides unique, cost-effective, and rapidly deployable capability to the Combatant Commanders. MDA currently supports forward-deployment of two batteries stationed in the USINDOPACOM area of responsibility. Specific to THAAD, MDA's request includes:

- **Terminal Defense *(PE 0603881C).*** MDA is requesting $277.9 million for THAAD development efforts in FY 2022. MDA will continue the development and integration of multiple, independent THAAD software builds to address the evolving threat, improve the Warfighter's defense planning, and improve the capability to engage SRBM, MRBM, and limited IRBM threats. These development efforts will enhance THAAD's capability against global operational threats. As part of the Terminal Defense request, MDA is requesting

  $64.6 million in FY 2022 to execute Rapid Acquisition efforts to develop and demonstrate THAAD interceptor and weapon system performance enhancements and capabilities needed to meet evolving threat requirements, including potential defensive capability against longer range threats. MDA will continue the development and demonstration of interceptor improvements to enhance THAAD capabilities against evolving threats. This effort will leverage the existing missile design improvement activities and develop software and hardware enhancements that will demonstrate THAAD capabilities.
- **Terminal Defense Testing *(PE 0604876C).*** MDA requests $32.7 million for Terminal Defense Testing in FY 2022, which supports the IMTP. This includes flight and ground testing, test operations and infrastructure, wargames, and exercises.
- **THAAD Procurement.** MDA is requesting $251.5 million for THAAD procurement in FY 2022 for 18 THAAD Interceptors, interceptor obsolescence mitigation, training support, Stockpile Reliability testing, and THAAD Battery Ground Component modifications to meet growing cyber threats.
- **THAAD Operations and Maintenance.** MDA is requesting $86.8 million for O&M in FY 2022 to support the maintenance and upkeep of all MDS-unique items of the fielded U.S. THAAD batteries and for all THAAD training devices. In FY 2022, MDA will provide support to seven THAAD batteries, including the two forward-based batteries stationed in the USINDOPACOM area of responsibility, and is prepared to support the U.S. Army in any future deployments around the world.

III. Technology

MDA is investing in advanced technology today to prepare for tomorrow's threats by improving system performance and effectiveness. This budget request will continue development of technology improvements for the current MDS, along with breakthrough technologies for integration into future missile defense architectures. These efforts include, advanced discrimination techniques, and hypersonic defense technology.

- **Hypersonic Defense *(PE 0604181C)*.** MDA requests $247.9 million for FY 2022 for Hypersonic Defense. MDA is developing a layered defensive architecture to address regional hypersonic threats from any source and leveraging sensors for early warning, identification, and tracking of regional and strategic hypersonic threats. The funding supports:

  1) the development of disruptive technologies for future hypersonic defense architectures; 2) the investment in engineering enablers for systems engineering activities to analyze, develop requirements and leverage engineering expertise at multiple Federally Funded Research and Development Centers (FFRDCs) and University Affiliated Research Center (UARC) for analyzing, testing, and recommending solutions for hypersonic defense; 3) leveraging and upgrading C2BMC systems to support hypersonic defense, and; 4) accelerate the development of an operational demonstration of a glide phase defense capability against regional hypersonic threats using the Aegis Weapon System.

- **Cruise Missile Defense Homeland Architecture and Demonstration *(PE 0603890C, Budget Project MD21)*.** MDA is requesting $13.9 million to begin the development of the system architecture for cruise missile defense of the homeland. In response to USNORTHCOM's requirements for cruise missile defense of the homeland, MDA will develop the systems architecture and conduct a demonstration of cruise missile defense capabilities using the Joint Tactical Integrated Fire Control (JTIFC) capability. The effort includes developing systems engineering requirements, software modifications, models and simulations, and integration of joint sensors and shooters into a fire control network for the demonstration of cruise missile defense capability.

- **Advanced Research Program *(PE 0603180C)*.** MDA is requesting $21.5 million in FY 2022, to conduct innovative, state of the art, and disruptive research and development with small and large businesses, universities, national laboratories, and allied nations to create and enable future missile defense capabilities aligned to the MDA Science and Technology Strategy. Key investments include proving out technologies in a relevant environment through high temperature material and seeker window characterization, as well as, nano-satellite and sounding rocket experiments and developing component technologies to support Missile Defense programs. In accordance with identified Agency requirements and Warfighter needs, the program assesses and demonstrates the utility of emerging component technologies, then facilitates transition of the technologies to the MDS. The program also manages the selection process and administers the Missile Defense Small Business Innovation Research (SBIR) program.
- **Advanced Concepts & Performance Assessment *(PE 0603176C).*** MDA is requesting $15.8 million in FY 2022 to centralize advanced technology concept modeling, simulation, and performance analysis. Advanced Concepts & Performance Assessments focus on the exploration of novel and emerging capabilities that may have the potential to enhance missile defense. The request will fund independent government assessments of industry sensor, directed energy, and weapon system technology concepts and mature related tracking, discrimination, and sensor fusion algorithms. Assessment activities include development of Hypersonic Defense, Artificial Intelligence and Machine Learning Initiatives, and Left-through-Right Integration key technology areas. The innovative structured concept definition and assessment methodology enables MDA to validate focus areas, verify contractor technology solutions, and evaluate promising concepts for use in future missile defense architectures. This program element supports the monitoring and tracking of cybersecurity mitigations, as well as the exploration of cyber effects on emerging technology.

MDA plans and executes a fully integrated test program that synchronizes the system under test with the Warfighters trained to operate the system under varying wartime conditions against current and emerging threats.

IV. Missile Defense Testing

- **MDS Testing *(PE 0603914C).*** MDA is requesting $362.9 million in FY 2022. In collaboration with stakeholders, the IMTP identifies and incorporates all testing requirements into a comprehensive, highly integrated, cost-effective series of flight tests, ground tests, cybersecurity tests, exercises, and wargames. IMTP Stakeholders, who are also signatories, include: Director, Operational Test & Evaluation (DOT&E); Director, Developmental Test, Evaluation and Assessments (DTE&A); Commander, Joint Functional Component Command for Integrated Missile Defense (JFCC IMD) representing Combatant Commands; Commander, Army Test and Evaluation Command (ATEC); Commander, Air Force Operational Test and Evaluation Center (AFOTEC); Commander, Operational Test and Evaluation Force (COMOPTEVFOR); and Commander, Joint Interoperability Test Command (JITC). For flight testing, the Agency incorporates the nine operational realism criteria defined by the Ballistic MDS Response to National Defense Authorization Act (NDAA) Section 234, for Fiscal Year 2005, Increasing Operational Realism. For system-level ground testing, all tests culminate in operational testing with Warfighters on console and independent operational assessments by the BMDS Operational Test Agency Team. This ensures that MDS capabilities are credibly demonstrated and validated prior to delivery to the Warfighter.

  The IMTP supports MDA's programming strategy and test priorities. This test program captures:

  - New GMD Test Program and plans for testing of the NGI.
  - GMD demonstrating the use of SBX Data for additional advanced Target Object Mapping techniques, upgraded In-Flight Interceptor Communications System (IFICS) In-Flight Data Terminal, GMD Enhanced Modem (GEM) with Exo-atmospheric Kill Vehicle (EKV) using 2-/3- stage selectable, in 3-stage mode.
  - Flight tests for SM-3 Block IIA production cut-in and the Aegis Weapon System C2BMC using Space Domain Awareness capability.
  - Increased flight test integration and interoperability testing with Allies.

- Updates on planning for cybersecurity testing through the FYDP.
- Refinements on test planning for system-level ground testing.
- Investment in the development of the Modified Ballistic Re-entry Vehicles (MBRV) Front End for future testing.

MDA also allocates funding for hypersonic partner flight tests in FY 2022 to be identified, requirements defined, and assets de-conflicted.

- **MDS Targets *(PE 0603915C)*.** MDA is requesting $553.3 million in in FY 2022 to develop, produce, and launch an economical and reliable inventory of targets based on engineering assessments of threat intelligence data. This funding enables the test, verification, and validation of the performance of the MDS against threats in support of the IMTP, and includes funding for the continued development of Advanced Targets, and development and production of more reliable and capable MRBM Target motors with enhanced maneuverability and range.

V. International

- **Israeli Programs.** MDA is requesting $500 million for Israeli programs in FY 2022. This funding level remains consistent with the Memorandum of Understanding between the United States and Israel that spans FY2019 – FY2028. This budget continues MDA's longstanding support of U.S.-Israeli Cooperative Programs, to include the co-development and co-production of the David's Sling Weapon System and the Arrow Weapon System. The Department continues to support co-production efforts for the Iron Dome Defensive System program to provide critical defense against short-range rockets and missiles, mortars, and artillery shells, and new capabilities against Unmanned Aerial Vehicles. In FY 2022, the MDA budget will also support several flight tests across the Israeli portfolio. These continued joint efforts provide Israel with a three-tiered defense to defend itself from ballistic missiles, rockets, and cruise missiles and ensures Israel maintains its qualitative military edge against its advisories.

Summary

MDA requests $8.917 billion in FY 2022 for missile defense development efforts to build Warfighter confidence by focusing on readiness and sustainment, increasing capability and capacity of fielded homeland and regional defense systems, and increasing the speed of delivery of advanced technology to counter the advanced missile threat.

THIS PAGE INTENTIONALLY LEFT BLANK

Missile Defense Agency
PB 2022 Missile Defense Agency
FY 2022- FY 2026 Appropriation Summary
R-1 Exhibit
($ Thousands)

Line Number	Program Element	Budget Project	Program	Budget Activity	FY20 Actual	FY21	FY22	FY23	FY24	FY25	FY26	FY22-26
O&M												
11A	0208866C		O&M	NA	545,973	574,273	502,450					
		MD08	Ground Base Midcourse	NA	152,235	148,749	156,623					
		MD07	THAAD	NA	86,425	89,903	86,828					
		MD09	AEGIS	NA	74,642	79,913	68,293					
		MD11	BMDS AN/TPY-2 Radars	NA	232,671	255,708	190,706					
			Budget Activity 00 Total	NA	545,973	574,273	502,450					
			O&M Total	NA	545,973	574,273	502,450					
Procurement												
	0208866C		PROCUREMENT	01	1,724,734	2,027,594	1,209,374					
		MD07	THAAD	01	407,203	578,335	251,543					
		MD80	Advanced Procurement NGI	01	0	0	0					
		MD55	Layered Homeland Defense Procurement	01	0	0	0					
		MD08	Ground Based Midcourse	01	285,471	150,000	0					
		MD09	AEGIS BMD	01	433,369	398,797	352,114					
		MD11	BMDS Sensors	01	10,046	243,270	2,738					
		MD14	SM-3 Block IIA	01	238,000	318,322	295,322					
		MD26	Arrow 3 Upper Tier System	01	55,000	77,000	62,000					
		MD34	Short Range Ballistic Missile Defense (SRBMD)(David's Sling Weapon Sy	01	50,000	50,000	30,000					
		MD73	Aegis Ashore Phase III	01	26,495	34,629	25,866					
		MD83	Iron Dome	01	95,000	73,000	108,000					
		MD90	Aegis BMD Hardware and Software	01	124,150	104,241	81,791					
37	MD650000		Guam Defense Acquisition	01	0	0	40,000					
		MD65	Defense of Guam Procurement	01	0	0	40,000					
			Budget Activity 01 Total	01	1,724,734	2,027,594	1,249,374					
			Procurement Total	01	1,724,734	2,027,594	1,249,374					
RDT&E												
32	0603176C		Advanced Concepts and Performance Assessment	03	45,852	49,410	15,800					
		MD71	Advanced Concepts and Performance Assessments	03	11,256	21,137	12,250					
		MD40	Program-Wide Support	03	605	592	607					
		MC71	Cyber Operations	03	33,991	27,681	2,943					
33	0603180C		Advanced Research	03	27,166	35,024	21,466					
		MD25	Advanced Technology Development	03	26,285	34,282	20,635					
		MD40	Program-Wide Support	03	881	742	831					
41	0603294C		Common Kill Vehicle Technology	03	13,319	11,058	0					
		MD85	Common Kill Vehicle Technology	03	10,660	10,619	0					
		MD40	Program Wide Support	03	2,659	439	0					
			Budget Activity 03 Total	03	86,337	95,492	37,266					
122	0202057C		Safety Program Management	04	0	0	2,323					
		MDSH	Safety Program Management	04	0	0	2,323					
125	0305103C		Cyber Security Initiative	04	11,109	1,148	1,142					
		MDCS	Cyber Security Initiative	04	11,109	1,148	1,142					
80	0603881C		Ballistic Missile Defense Terminal Defense Segment	04	295,312	312,317	277,949					
		MD07	THAAD	04	185,483	259,923	251,192					
		MC07	Cyber Operations	04	15,037	9,806	11,977					
		MD06	Patriot Advanced Capability-3 (PAC-3)	04	86,767	26,198	1,226					
		MD40	Program-Wide Support	04	8,025	16,390	13,554					
81	0603882C		Ballistic Missile Defense Midcourse Defense Segment	04	1,275,414	1,219,261	745,144					
		MD08	Ground Based Midcourse	04	1,142,633	1,134,545	690,929					
		MC08	Cyber Operations	04	76,467	44,824	24,800					
		MD40	Program-Wide Support	04	56,314	39,892	29,415					
83	0603884C		Ballistic Missile Defense Sensors	04	348,356	265,803	224,750					
		MD11	BMDS Radars	04	308,276	253,045	197,816					
		MC11	Cyber Operations	04	28,296	1,558	17,203					
		MD40	Program-Wide Support	04	11,784	11,200	9,731					
84	0603890C		BMD Enabling Programs	04	630,196	616,455	595,301					

Missile Defense Agency
PB 2022 Missile Defense Agency
FY 2022- FY 2026 Appropriation Summary
R-1 Exhibit
($ Thousands)

Line Number	Program Element	Budget Project	Program	Budget Activity	FY20 Actual	FY21	FY22	FY23	FY24	FY25	FY26	FY22-26
		MD24	System Engineering & Integration	04	168,022	174,753	167,118					
		MD21	Homeland Cruise Missile Defense Architecture	04	0	3,000	13,921					
		MT23	Enabling - Test	04	58,143	49,293	41,576					
		MD28	Intelligence & Security	04	42,554	42,501	39,550					
		MD30	BMD Information Management Systems	04	86,992	84,753	92,729					
		MC30	Cyber Operations	04	115,404	64,659	78,248					
		MD31	Modeling & Simulation	04	82,344	107,710	87,068					
		MC31	Engineering Cyber Operations	04	23,322	35,709	22,462					
		MD32	Quality, Safety, and Mission Assurance	04	29,780	30,269	29,527					
		MD40	Program-Wide Support	04	23,635	23,808	23,102					
85	0603891C		Special Programs - MDA	04	504,031	390,216	413,374					
		MD27	Special Programs	04	504,031	390,216	413,374					
86	0603892C		AEGIS BMD	04	722,582	877,336	732,512					
		MD09	Aegis BMD	04	285,313	361,441	437,453					
		MM09	Aegis BMD SM-3 Development	04	243,194	307,970	124,708					
		MC09	Cyber Operations	04	16,455	29,392	3,750					
		MX09	Aegis BMD Development Support	04	151,772	148,030	136,506					
		MD40	Program-Wide Support	04	25,848	30,503	30,095					
87	0603896C		Ballistic Missile Defense Command and Control, Battle Management &	04	550,513	645,741	603,448					
		MD01	Command & Control, Battle Management, Communications (C2BMC)	04	316,770	417,583	380,218					
		MC01	Cyber Operations	04	32,649	12,658	10,537					
		MT01	C2BMC Test	04	63,395	61,264	65,341					
		MX01	Command & Control, Battle Management, Communications (C2BMC) D	04	114,017	128,482	125,086					
		MD40	Program-Wide Support	04	23,682	25,754	22,266					
88	0603898C		Ballistic Missile Defense Joint Warfighter Support	04	51,095	49,560	50,594					
		MD03	Joint Warfighter Support	04	17,242	14,903	18,490					
		MT03	Joint Warfighter Support Test	04	31,507	32,531	29,990					
		MC03	Cyber Operations	04	152	157	155					
		MD40	Program-Wide Support	04	2,194	1,969	1,959					
89	0603904C		Missile Defense Integration and Operations Center (MDIOC)	04	54,783	55,356	52,403					
		MD22	Missile Defense Integration and Operations Center (MDIOC)	04	51,633	52,519	49,740					
		MC22	Cyber Operations	04	618	638	638					
		MD40	Program-Wide Support	04	2,532	2,199	2,025					
90	0603906C		Regarding Trench	04	22,550	11,863	11,952					
		MD35	Regarding Trench	04	22,550	11,863	11,952					
91	0603907C		Sea Based X-Band Radar (SBX)	04	137,604	118,318	147,241					
		MX46	Sea Based X-Band Radar Development Support	04	132,537	113,618	141,567					
		MD40	Program-Wide Support	04	5,067	4,700	5,674					
92	0603913C		Israeli Cooperative Programs	04	300,000	300,000	300,000					
		MD26	Arrow Weapon System	04	159,000	173,000	173,000					
		MD34	Short Range Ballistic Missile Defense (SRBMD)(David's Sling Weapon Sy	04	141,000	127,000	127,000					
93	0603914C		Ballistic Missile Defense Test	04	398,939	365,208	362,906					
		MT04	BMDS Test Program	04	372,533	341,475	337,424					
		MC04	Cyber Operations	04	10,902	8,706	8,254					
		MD40	Program Wide Support	04	15,504	15,027	17,228					
94	0603915C		Ballistic Missile Defense Targets	04	545,764	536,133	553,334					
		MC05	Cyber Operations	04	890	1,698	1,484					
		MT05	BMDS Targets Program	04	529,029	513,139	532,690					
		MD40	Program Wide Support	04	15,845	21,296	19,160					
99	0604102C		Guam Defense Development	04	0	0	78,300					
		MD65	Defense of Guam Development	04	0	0	78,300					
100	0604115C		Technology Maturation Initiatives	04	259,465	107,389	0					
		MD98	Directed Energy Demonstrator Development	04	108,685	42,000	0					
		MD99	Discrimination Sensor Demonstrator Development	04	135,993	62,237	0					
		MC98	Cyber Operations	04	463	475	0					
		MT99	Technology Maturation Initiatives Test	04	5,056	0	0					

Missile Defense Agency
PB 2022 Missile Defense Agency
FY 2022- FY 2026 Appropriation Summary
R-1 Exhibit
($ Thousands)

Line Number	Program Element	Budget Project	Program	Budget Activity	FY20 Actual	FY21	FY22	FY23	FY24	FY25	FY26	FY22-26
		MD40	Program Wide Support	04	9,268	2,677	0					
103	0604181C		Hypersonic Defense	04	386,528	272,632	247,931					
		MD29	Hypersonic Defense	04	379,830	262,549	239,151					
		MD40	Program Wide Support	04	6,698	10,083	8,780					
111	0604672C		Homeland Defense Radar-Hawaii	04	181,569	133,000	0					
		MD41	Homeland Defense Radar - Hawaii (HDR-H)	04	174,756	133,000	0					
		MD40	Program-Wide Support	04	6,813	0	0					
112	0604673C		Pacific Discriminating Radar	04	2,921	0	0					
		MD51	Pacific Radar (PAC Radar)	04	1,366	0	0					
		MD40	Program Wide Support	04	1,555	0	0					
115	0604873C		Long Range Discrimination Radar (LRDR)	04	131,135	138,317	133,335					
		MD96	Long Range Discrim Radar (LRDR)	04	126,158	132,865	128,192					
		MD40	Program Wide Support	04	4,977	5,452	5,143					
116	0604874C		Improved Homeland Defense Interceptors	04	514,062	860,384	926,125					
		MD15	Risk Reduction	04	155,000	200,000	0					
		MD80	Next Generation Interceptor Development (NGI)	04	310,000	634,005	890,206					
		MD97	Improved HD Interceptors	04	35,643	0	0					
		MD40	Program Wide Support	04	13,419	26,379	35,919					
117	0604876C		Ballistic Missile Defense Terminal Defense Segment Test	04	24,771	1,000	32,697					
		MT07	THAAD Test	04	24,051	691	30,174					
		MD40	Program Wide Support	04	720	309	2,523					
118	0604878C		Aegis BMD Test	04	167,364	71,498	117,055					
		MC13	Network _System Certification and Accreditation - C&A	04	0	634	0					
		MT09	AEGIS BMD Test	04	161,403	64,076	111,996					
		MD40	Program Wide Support	04	5,961	6,788	5,059					
119	0604879C		Ballistic Missile Defense Sensor Test	04	96,082	64,245	77,428					
		MT11	BMDS Radars Test	04	91,605	61,208	74,272					
		MD40	Program Wide Support	04	4,477	3,037	3,156					
120	0604880C		Land Based SM-3 (LBSM3)	04	36,918	56,628	43,158					
		MD68	AEGIS Ashore	04	32,922	51,764	39,594					
		MC68	Cyber Operations	04	2,365	2,615	944					
		MD40	Program-Wide Support	04	1,631	2,249	2,620					
121	0604887C		Ballistic Missile Defense Midcourse Defense Segment Test	04	96,711	67,071	61,424					
		MT08	Midcourse Test	04	93,803	64,407	59,503					
		MD40	Program Wide Support	04	2,908	2,664	1,921					
127	1206893C		Space Tracking and Surveillance System	04	35,469	34,144	15,176					
		MD12	Space Tracking and Surveillance System (STSS)	04	31,796	32,044	14,437					
		MC12	Cyber Operations	04	2,147	744	156					
		MD40	Program-Wide Support	04	1,526	1,356	583					
128	1206895C		Ballistic Missile Defense System Space Programs	04	139,887	162,068	292,811					
		MD24	Test Support	04	239	0	0					
		MD33	MD Space Exp Center (MDSEC)	04	24,967	30,408	30,066					
		MD42	Hypersonic & Ballistic Tracking Space Sensor (HBTSS) Prototyping	04	108,139	130,000	256,222					
		MC33	MD Space Exp Center (MDSEC)	04	5,370	386	1,358					
		MD40	Program-Wide Support	04	1,172	1,274	5,165					
			Budget Activity 04 Total	04	7,921,130	7,733,091	7,099,813					
168	0605502C		Small Business Innovation Research - MDA	06	107,824	0	0					
		MD45	Small Business Innovation Research	06	107,824	0	0					
199	0901598C		Management HQ - MDA	06	27,065	26,902	24,102					
		MD38	Management Headquarters	06	27,065	26,902	24,102					
			Budget Activity 06 Total	06	134,889	26,902	24,102					
			RDT&E Total	06	8,142,356	7,855,485	7,161,181					
MILCON												
	0603882C		MID-COURSE MILCON	NA	0	48,000	0					
		MM08	Missile Defense Complex, Ft. Greely, AK	NA	0	48,000	0					
	22299902		MINOR MILCON	NA	10,000	4,922	4,435					

Missile Defense Agency
PB 2022 Missile Defense Agency
FY 2022- FY 2026 Appropriation Summary
R-1 Exhibit
($ Thousands)

Line Number	Program Element	Budget Project	Program	Budget Activity	FY20 Actual	FY21	FY22	FY23	FY24	FY25	FY26	FY22-26
		MM14	Minor MILCON	NA	10,000	4,922	4,435					
	33399903		MILCON PLANNING AND DESIGN	NA	35,472	0	0					
		MM32	CTC - Planning and Design	NA	35,472	0	0					
			Budget Activity 00 Total	NA	45,472	52,922	4,435					
			MILCON Total	NA	45,472	52,922	4,435					
			Program Total		**10,458,535**	**10,510,274**	**8,917,440**					

Reporting Requirement Reference	Reporting Requirement Language	Budget Documentation Location
FY04 National Defense Authorization Act (H.R. 1588) Report 108-354, pp. 30-31	**BUDGET JUSTIFICATION MATERIALS** In the budget justification materials submitted to Congress in support of the Department of Defense budget for any fiscal year (as submitted with the budget of the President under section 1105(a) of title 31), the Secretary of Defense shall specify, for each ballistic missile defense system element for which the Missile Defense Agency is engaged in planning for production and initial fielding, the following information: (1) The production rate capabilities of the production facilities planned to be used for production of that element. (2) The potential date of availability of that element for initial fielding. (3) The estimated date on which the administration of the acquisition of that element is to be transferred from the Director of the Missile Defense Agency to the Secretary of a military department.	MDA to provide BMDS Accountability Report (BAR) to Congressional Defense Committees. The BAR partially satisfies the requirement through its schedule baseline. **Exhibit P-21 – Budget Production Schedule**
FY04 National Defense Authorization Act (H.R. 1588), Report 108-354, pp. 30-31	**FUTURE-YEARS DEFENSE PROGRAM** The Secretary of Defense shall include in the future-years defense program submitted to Congress each year under section 221 of this title an estimate of the amount necessary for procurement for each ballistic missile defense system element, together with a discussion of the underlying factors and reasoning justifying the estimate.	**Exhibit P-21 – Budget Production Schedule**

THIS PAGE INTENTIONALLY LEFT BLANK

ACRONYMS	DEFINITION
A	
A&A	Assessment and Authorization
A&AS	Advisory and Assistance Services
AAEA	Aegis Ashore Engineering Agent
AAMDS	Aegis Ashore Missile Defense System
AAMDTC	Aegis Ashore Missile Defense Test Complex
AAW	Anti-Air Warfare
ABEWS	Airborne Early Warning System
ACB	Advanced Capability Build
ACD	Adversary Capability Document
ACD	Advance Capability Development
ACD&P	Advanced Component Development & Prototypes
ACL	Achievable Capabilities List
ACS	Aegis Combat System
ADP	Arrow Deployability Program; Automated Data Processing; Adversary Delta Package
AEDC	Arnold Engineering Development Center
AFB	Air Force Base
AI&T	Assembly, Integration and Test
AIE	Annual Integration Event
ALO	Aegis Light-Off
AMCOM	Army Aviation and Missile Command
AMDR	Air and Missile Defense Radar
AMRDEC	Aviation and Missile Research, Development and Engineering Center
AN/SPY-1	Joint Army-Navy equipment nomenclature: S -Water (surface ship), P - Radar, Y - Surveillance (target detecting and tracking) and Control (fire control and/or air control), 1 - model number [AN/SPY-1 is an equipment nomenclature, not an Acronym]
AN/TPY-2	Joint Army-Navy equipment nomenclature: T - Transportable (ground), P - Radar, Y - Surveillance (target detecting and tracking) and Control (fire control and/or air control), 2 - model number [AN/TPY-2 is an equipment nomenclature, not an Acronym]
AO	Authorizing Official
AOA	Analysis of Alternatives
AOR	Area of Responsibility
APL	Applied Physics Laboratory
APLITS	Approved Products List Integrated Tracking System
APNT	Assured Position Navigation and Timing
ARC	Advanced Research Center
ARSTRST	(US) Army Forces Strategic Command
ASD(R&E)	Assistant Secretary of Defense Research and Engineering
ASDM	Acquisition Strategy Decision Memorandum
ASUW	Anti-Surface Warfare
AT&L	Acquisition, Technology and Logistics
ATD	Advanced Technology Development; Assistant to the Director; Assistant Test Directors
ATEC	Army Test and Evaluation Command
ATK	Alliant Techsystems, Inc.
ATO	Authorization to Operation; Authority to Operate
AUPP	Average Unit Production Price
AUR	All Up Round
AWS	Arrow Weapon System; AEGIS Weapon System
B	
BAA	Broad Agency Announcement
BAM	BMDS Asset Management
BCM	BMDS C2BMC Model
BCN	BMDS Communications Network
BCS	Battle Command System
BL	Baseline
BM	Battle Management; Ballistic Missile
BMC	Battle Management Center
BMD	Ballistic Missile Defense
BMDQ	Ballistic Missile Defense Qualification
BMS	Builing Management System
BMDS	Ballistic Missile Defense System
BNOSC	BMDS Network Operations and Security Center

ACRONYMS	DEFINITION
BOA	BMDS Overhead Persistent Infrared Architecture
BoD	Boards of Director
BORRS	BMDS Operational Readiness Reporting System
BSA	Budget Sub-Activity
BSC	Battlespace Characterization
BSO	BMDS Safety Officers
BST	BMDS System Track
BTS	BMDS Test Site
BWO	BMDS Watch Officers
C	
C-UAS	Unmanned Aerial Systems
C&A	Certification and Accreditation
C/FFP	Cost Fixed Firm Price
C2	Command and Control
C2BMC	Command and Control, Battle Management, and Communications
C2P	Command and Control Processor
C4I	Command, Control, Communications, Computers and Intelligence
CA	Certification Authority
CANES	Consolidated Afloat Networks and Enterprise Services
CARD	Cost Analysis and Requirements Document
CBAU	Consolidated Booster Avionics Upgrade
CCA	Circuit Card Assemblies
CCaR	Comprehensive Cost and Requirements
CCC	C2BMC Command Center
CCM	Counter Counter-Measures
CCMD	Combatant Commander; Combatant Commands
CD	Concept Descriptions; Cobra Dane
CDA	Continuous Digital Assessment
CDI	Continuous Development and Integration
CDR	Critical Design Review
CDS	Cross Domain Solution
CEC	Critical Engagement Condition
CENAU	Corps of Engineers North Atlantic Union
CENTCOM	Central Command
CERT	Computer Emergency Response Team
CFBLNet	Combined Federated Battle Laboratories Network
CG	US Navy ship hull classification symbol for - Guided Missile Cruiser [CG is not an Acronym]
CI/CAT	Continuous Integration/Continuous Agile Testing
CIC	Counterintelligence in Cyberspace
CID	Critical Item Development
CIDS	Critical Items Description Specifications
CIL	Computer in the Loop
CIO	Chief Information Officer
CIP	Capability Insertion Packages
CKV	Common Kill Vehicle
CLAN	Classified Local Area Network
CLE	Command and Launch Equipment
CLS	Contractor Logistics Support
CMD-H	Cruise Missile Defense of the Homeland
CND	Computer Network Defense
CNDSP	Computer Network Defense Service Provider
CNET	Classified Network
COCOM	Combatant Command
COMSEC	Communication Security
CONOPS	Concept of Operations
CONPLANS	Contingency Plans
CONUS	Continental United States
COOP	Calibrated Orbiting Objects Program ; Continuity of Operations
CoS	Colorado Springs
COTS	Commercial Off The Shelf
CPU	Congressional Plus Up
CPAF	Cost Plus Award Fee

ACRONYMS	DEFINITION
CPCR	Computer Program Change Request
CPFF	Cost Plus Fixed Fee
CPI	Critical Program Information
CPIF	Cost Plus Incentive Fee
CPTS	Computer Program Test Site
CS	Combat System
CSCS	Center for Surface Combat Systems
CSS	Contractor Support Services
CSSC	C2BMC System Support Center
CSSP	Cyber Security Service Provider
CTB	C2BMC Test Bed
CTM	Core Truth Models
CTTO	Concurrent Test, Training and Operations
CTV	Control Test Vehicle
CTV-01	Controlled Test Vehicle-01
CU	Capability Upgrade
CUI	Controlled Unclassified Information
CVPA	Cyber Vulnerability Penetration Assessment
CVT	Controls Validation Testing
CY	Calendar Year
D	
DA	Defend Area
DAA	Defense Appropriations Act; Designated Approving Authority
DAC	Divert Attitude Control
DACS	Divert and Attitude Control System
DARPA	Defense Advanced Research Projects Agency
DASD(DT&E)	Deputy Assistant Secretary of Defense, Developmental Test and Evaluation
DASD(DT&E)	Deputy Assistant Secretary of Defense, DT&E
DAU	Defense Acquisition University
DDG	US Navy ship hull classification symbol for - Guided Missile Destroyer [DDG is not an Acronym]
DDL	Dual-band Data Link; Digital Data Link
DECC	Defense Enterprise Computing Center
DEDD	Directed Energy Demonstrator Development
DESH	MDA/DESH - Missile Defense Agency (MDA)/Modeling & Simulation Huntsville (DESH) [office symbol within MDA Engineering Directorate, not an Acronym]
DETSIM	Detection Simulation
DEVSECOPS	Development, Security and Operations
DFAR	Defense Federal Acquisition Regulation
DHP	Data Handling Plan
DIA	Defense Intelligence Agency
DIACAP	DoD Information Assurance Certification and Accreditation Process; DoD Information Assurance Certification and Accreditation Program
DIB	Defense Industrial Base
DISA	Defense Information Systems Agency
DISN	Defense Information System Network
DL	Data Link
DO	Delivery Order
DoD	Department of Defense
DODIC	DoD Identification Code
DODIN	DoD Information Network
DOT&E	Director of Operational Test and Evaluation
DOTMLPF	Doctrine, Organization, Training, Material, Leadership and Education, and Personnel and Facilities
DPALS	Diode Pumped Alkali Laser System
DREN	Defense Research Engineering Network
DSC	Development and Sustainment Contract
DSCS	Defense Satellite Communication System
DSDD	Discrimination Sensor Demonstrator Development
DSS	Defense Security Service
DSWS	David's Sling Weapon System
DT&E	Developmental Test and Evaluation
DTRA	Defense Threat Reduction Agency
DTS	Distributed Training System

ACRONYMS	DEFINITION
DTSS	Directorate of Test Support System
DVSG	DISN Video Services Global
DW	Defense Wide
DWCF	Defense Working Capital Fund
E	
ET-17	Engineering Topic 17
ET&T	Engineering Test and Evaluation
E/CCA	Element/Component Characteristics for Analysis
EA	Executing Agent; Engineering Assessment
EADSIM	Extended Air Defense Simulation
EAL	Evaluated Assurance Level
EAS	Eareckson Air Station
ECART	Electronic Content and Records Tool
ECE	Element Cybersecurity Experiments
ECP	Engineering Change Proposal
ECS	Element Capability Specification; Engineering Change Summary
EDISS	End to end Digital Integrated System-level Simulation
EDISS	Enterprise Digital Integrated System Simulation
EDP	Early Digital Product
EE	Engineering Evaluation
EEU	Electronics Equipment Unit
EHF	Extremely High Frequency
EKV	Exoatmospheric Kill Vehicle
E-LMS	Electronic Learning Management System
eMASS	Enterprise Mission Assurance Support Service
EMD	Engineering Manufacturing Development
EME	Electromagnetic Environment
EMRL	Engineering and Manufacturing Readiness Level
EO/IR	Electro-Optical/Infrared
EOQ	Economic Order Quantity
EoR	Engage-on-Remote
EP	Electronic Protection
EPAA	European Phased Adaptive Approach
EQLB	Executive Quick Look Briefing
ERT	Element Review Team
ES	Elevated Sensor; Element Specification
ESI	External System Interface; Enterprise Software Initiative
ESL	External Sensors Lab; Enterprise Sensors Laboratory
ESL	Enterprise Sensors Laboratory
ESOH	Environmental, Safety and Occupational Health
ESS	Electronic Security System
ESS	Endpoint Security Services
ET	Embedded Test;
ETEDDS	End to End Distributed Development System
EUCOM	European Command
EVMS	Earned Value Management System
EWR	Early Warning Radar
EWS	Enterprise Work Stations
F	
FAR	Federal Acquisition Regulation
FCS	Fire Control Section; Fire Control System (SPY/FCS - AN/SPY radar Fire Control System)
FDE	Force Developers Evaluation
FENSR	Force Engagement and Sensor Coordination - Raid
FFP	Firm Fixed Price
FFPLOE	Firm Fixed Prices Level of Effort
FFRDC	Federally Funded Research and Development Center
FILEMAN	File Manager
FISMA	Federal Information Security Management Act
FMA	Foreign Material Acquisition; Foreign Military Asset
FMS	Foreign Military Sales
FOIA	Freedom of Information Act

ACRONYMS	DEFINITION
FPA	Focal Plane Array
FPAF	Fixed Price Award Fee
FPEPA	Fixed Price with Economic Price Adjustment
FPIF	Fixed Price Incentive Firm
FPIS	Fixed Price Incentive Successive
FRACAS	Failure Reporting, Analysis, and Corrective Action System
FRCS	Facility-related control
FSRM	Facilities, Sustainment, Restoration, and Modernization
FT	Flight Test
FTCN	Flight Test Communication Network
FTG	Flight Test GMD
FTM	Flight Test Mission
FTT	Flight Test - THAAD
FY	Fiscal Year
FYDP	Future Years Defense Program; Fiscal Year Defense Plan
G	
GBI	Ground Based Interceptor
GBR-P	Ground Based Radar Prototype
GCC	Geographic Combatant Commands
GCN	Global Command Network; GMD Communications Network
GDIL	GMD Development Integration Lab
GEM	Global Engagement Manager; Guidance Enhancement Missiles (PATRIOT)
GEO	Geosynchronous Earth Orbits
GEP	Ground Entry Point
GEU	Guidance Electronics Unit
GFC	GMD Fire Control
GFC / C	GMD Fire Control and Communications
GFE	Government Furnished Equipment
GFI	Government Furnished Information
GFS	Government Furnished Services
GM	Ground-based Midcourse
GMD	Ground-based Midcourse Defense
GNC	Guidance, Navigation and Control
GOTS	Government Off-The-Shelf
GP	Green Pine
GPI	Glide Phase Intercept
GPS	Global Positioning System
GS	Ground Systems; Guidance Section
GSA	General Service Administration
GSIL	GMD Software Integration Lab
GSS	Global Combatant Command
GT	Ground Test
GTD	Ground Test Distributed
GTI	Ground Test Integrated
GTISS	Ground Test Integrated System-level Simulation (GTISS)
GTRI	Georgia Tech Research Institute
GTX	Ground Test (Element to Element)
GWS	GMD Weapon System
H	
HA	Hit Assessment
HALO	High Altitude Observatory
HARRT	HMD Risk Reduction and Testing
HBTSS	Hypersonic and Ballistic Tracking Space Sensor
HD	Hypersonic Defense
HDAWG	Homeland Defense Architecture Working Group
HDR-H	Homeland Defense Radar - Hawaii
HEMP	High Altitude Electromagnetic Pulse
HEMTT	Heavy Expanded Mobility Tactical Truck
HEO	Highly Elliptical Orbits
HGV	Hypersonic Glide Vehicle
HIL	Human-in-the-Loop; Hardware-in-the-Loop
HLD	Homeland Defense

ACRONYMS	DEFINITION
HMI	Human Machine Interface
HRTS	Human Resource Tracking System
HRTS/PTS	Human Resource Tracking System/Personnel Tracking System
HTT	Hardened Transportable Terminal
HVAC	Heating, Ventilation, and Air Conditioning
HWIL	Hardware-in-the-loop
I	
I&T	Integration & Test
IA	Information Assurance
IAI	Israel Aircraft Industries; Israel Aerospace Industries
IAM	Information Assurance Manager
IAMD	Integrated Air and Missile Defense
IAR	Intra-agency Acquisition Review
IAVA	Information Assurance Vulnerability Alerts
IAW	In Accordance With
IBCS	Integrated Battle Command System
IBR	Integrated Baseline Review
ICBM	Intercontinental Ballistic Missiles
ICD	Interface Control Document
ICP	Interface Change Proposal
ICS	Industrial Control System
ICTA	Information Technology Networks and Systems
IDIQ	Indefinite Delivery Indefinite Quantity
IDMP	Integrated Data Management Plan
IDS	Interface Description Specifications
IDT	In-Flight Interceptor Communications System Data Terminal
IFICS	In-Flight Interceptor Communications System
IHLD	Improved Homeland Defense Interceptors
ILS	Integrated Logistics Support
IM	Insensitive Munitions
IMAP	Integrated Master Assessment Plan
IMD	Integrated Missile Defense
IMoD	Israeli Ministry of Defense
IMPACT	Information Management Program Activity Control Tool
IMTP	Integrated Master Test Plan
IMU	Inertial Measurement Unit
INFOSEC	Information Security
INSURV	Inspection and Survey
IOC	Initial Operational Capability
IPR	In-Process Review
IPT	Integrated Product Team
IR	Infra-red
IRBM	Intermediate-Range Ballistic Missiles
IRES	Integrated Research & Development for Enterprise Solutions
IRD	Initial Requirement Documents
ISA	Installation Support Agreements
ISA&I	Israeli System Architecture and Integration
ISIM	International Simulation
ISSM	Information Systems Security Manager
ISSAM	Information Assurance System Security Manager
IT	Integrated Test; Information Technology
ITB	Institutional Training Base; Israeli Test Bed
IV&V	Independent Verification and Validation
IWS	Indications and Warning System; Integrated Warfare Systems
J	
JAD2	Joint All Domain Command and Control
JEON	Joint Emergent Operational Need
JEWL	Joint Early Warning Laboratory
JFCC	Joint Functional Component Command
JFCC-IMD	Joint Functional Component Command - Integrated Missile Defense
JHU	John Hopkins University
JHU/APL	John's Hopkins University/Applied Physics Laboratory

ACRONYMS	DEFINITION
JIAMDO	Joint integrated Air and Missile Defense Organization
JIE	Joint Information Environment
JLVC	Joint Live Virtual Constructive
JNIC	Joint National Integration Center, Schriever AFB, CO
JRDC	JNIC Research and Development Contract
JRMET	Joint Reliability and Maintainability Evaluation Team
JSP	Joint Service Provider
JTIDS	Joint Tactical Information Distribution System
JTIFC	Joint Tactical integrated Fire Control
JWSP	Joint Warfighter Support Program
K	
KIDD	Kinetic Impact Debris Distribution
KP	Knowledge Points
KTF	Kauai Test Facility
KV	Kill Vehicle
KW	Kinetic Warhead
L	
LBSM3	Land Based SM-3 (early name for Aegis Ashore)
LCC	Launcher Control Center; Local Control Center
LES	LRDR Equipment Shelter
LHCT	Long Haul Communications Transport
LHD	Layered Homeland Defense
LLNL	Lawrence Livermore National Laboratory
LM	Lockheed Martin
LMMT	Link Monitoring and Management Tool
LM-RMS	Lockheed Martin Rotary and Mission Systems
LMSSC	Lockheed Martin Space Systems Company
LNA	Low Noise Amplifiers
LNO	Liaison Officer
LoR	Launch on Remote
LRDR	Long Range Discrimination Radar
LRDS	Long Range Detection Suite
LRS&T	Long Range Surveillance and Tracking; Long Range Surveillance and Track
LRU	Line Replaceable Unit'
LSC	Launch Site Controller
LSE	Launch Support Equipment
LSS	Launch Support Systems
LTPO	Lower Tier Program Office
M	
M&S	Materials and Structure; Modeling and simulation
MAIDIQ	Multi-Awarded IDIQ
MAIS	Major Automated Information System
MAJCOM	Major Command
MAP	MDA Assurance Plan; MDA Assurance Provisions
MAR	MDA Assurance Representative
MARAD	Maritime Administration
MARS	Modular Analysis and Reporting Suite
MBIT	Misssile Built in Tests
MBRV	Modified Ballistic Reentry Vehicle
MBSE	Model Based Systems Engineering
MCC-T	Mission Control Center - Targets
MCF	Mission Control Facility
MCS	Mobile Communications Suite
MD	Missile Defense
MDA	Missile Defense Agency
MDACNET	
MDAHQ	Missile Defense Agency Headquarters
MDAP	Major Defense Acquisition Program
MMDC	Missile Defense Data Center
MDDE	Missile Defeat and Enhancements
MDEB	Missile Defense Executive Board
MDIOC	Missile Defense Integrated Operations Center

ACRONYMS	DEFINITION
MDOC	Missile Defense Operations Centers
MDR	Mission Data Review
MDS	Missile Defense System
MDSC	Missile Defense Space Center
MDSEC	Missile Defense Space Experimentation Center
MDST	Missile Defense Space Warning Tool
MEDDS	Mission Execution and Display Distribution System
MEDIC	Multi-band Electronic attack Digital Injection Capability
MEIT	Multi-Element Integration and Test
MFRL	Modification and Fielding Request List
MFU	Missile Firing Unit
MHA	Management Headquarters Activity
MICS	MDA Integrated Communications Services
MiDAESS	Missile Defense Agency Engineering and Support Services
MILCON	Military Construction; Military Construction funding (type of Appropriation)
MILSATCOM	Military Satellite Communications
MIL-STD	Military Standards
MIP	Master Integration Plan
MIPR	Military Interdepartmental Purchase Request
MIS	MDSDC Interchange System; MDSEC Interchange System
MISL	Missile Intelligence Secure Link
MIT	Miniature Interceptor Technology; Massachusetts Institute of Technology
MIT/LL	Massachusetts Institute of Technology, Lincoln Laboratory, Lexington, MA
MMR	Multi-Mission Radar
MMU	Mass Modal Unit
MOC	Missile Defense Agency Operations Center
MOKV	Multi Object Kill Vehicle
MOU	Memorandum of Understanding
MPAN	Missile Power Application Non-Launch
MPG	Mission Processing Group
MPL	ManPower Loading
MRBM	Medium-Range Ballistic Missiles
MRP	Missile Reprogramming
MS	Mobile Sensor
MSC	Military Sealift Command
MSE	Missile Segment Enhancement
MSVP	Missions Specific Vendor Plug-in
MTC2	Maritime Comand and Control
MTOE	Modified Table of Organization and Equipment
MW/MD	Missile Warning/Missile Defense
MW/SS	Missile Warning/Space Surveillance
N	
NATO	North Atlantic Treaty Organization
NAVFAC	Naval Facilities Engineering Command
NAVSEA	Naval Sea Systems Command
NAWC	Naval Air Warfare Center
NCR	National Capital Region
NDAA	National Defense Authorization Act
NEPA	National Environmental Policy Act
NGI	Next Generation Interceptors
NGAS	Northrop Grumman Aerospace Systems
NICE	National Initiative for Cybersecurity Education
NIST	National Institute of Standards and Technology
NORAD	North American Aerospace Defense Command
NORTHCOM	Northern Command
NOSC	Network Operations Security Center
NRL	Naval Research Laboratory, Washington, DC
NSA	National Security Agency
NSWC	Naval Surface Warfare Center
O	
O&M	Operations and Maintenance
O&S	Operations and Sustainment

ACRONYMS	DEFINITION
OA	Open Architecture: Operational Acceptance
OCB	Operational Capacity Baseline
OCO	Overseas Contingency Operations
OCONUS	Outside of CONUS
OEM	Original Equipment Manufacturer
OGA	Other Government Agency
OMB	Office of Management and Budget
OPIR	Overhead Persistent Infrared
OPLAN	Operations Plan
OPSEC	Operations Security
OPTISIG	Optical Signatures In-Line Generator
OQE	Objective Qualitative Evidence
ORNL	Oak Ridge National Laboratory
OSC	Operations Support Center; Optical Signatures Code
OSC/OPTISIG	Optical Signatures Code/Optical Signature Inline Generator
OSD	Office of the Secretary of Defense
OSF	Objective Simulation Framework
OSH	Occupational Safety and Health
OSM	Object Sighting Message; Open Systems Architecture Sensor Models
OSPT	Operations Support Planning Team
OTA	Operational Test Agencies
OUSD/AT&L	Office of Under Secretary of Defense/Acquisitions, Technology and Logistics
P	
P&P	Policy and Procurement
PA	Performance Assessments; Project Arrangement
PAA	Phased Adaptive Approach
PAAWNS	Protected Anti-Jam/Anti-Scintillation Wideband Net-Centric System
PAC-3	Patriot Advanced Capability-3
PACOM	Pacific Command
PATRIOT	Phased Array Tracking Radar Intercept on Target
PAV	Performance Assessment and Verification
PB	President's Budget
PCIL	Prime Consolidated Integration Lab
PCL	Prioritized Capabilities List
PCO	Procurement Contracting Office
PCRSS	Pacific Collector Range Safety System
PDR	Preliminary Design Review
PE	Program Element
PEELS	Parametric Endo/Exo-atmospheric Lethality Simulation
PEO IWS	Program Executive Office - Integrated Warfare Systems
PFR	Post Flight Reconstruction
PIA	Post Intercept Assessment
PID	Post Intercept Debris
PIDS	Prime Item Development Specifications
PLET	Phenomenology, Lethality, Environment, Threat
PM	Program Manager
PM/IAM	Program Manager/Information Assurance Manager
PMAP	Process Mission Assurance Plan
PMDCATS	Program Manager - Communications and Transmission Systems
PME	Primary Mission Equipment
PMI	Preventative Maintenance Inspection
PMP	Parts, Materials and Processes
PMPCB	Parts, Materials, and Process Board Requirements
PMRF	Pacific Missile Range Facility, Barking Sands, Kauai, HI
PMT	Pre-Mission Test
PNT	Positioning, Navigation and Timing
POA&M	Plan of Action and Milestones
POC	Point of Contact
PPU	Prime Power Unit
PRIDE	Program Resource Internet Database Environment
PWS	Program-Wide Support
PY	Prior Year

ACRONYMS	DEFINITION
Q	
QRT	Quick Response Team
QSMA	Quality Safety and Mission Assurance
R	
R&C	Readiness and Control
RAFU	Radar Field Upgrade
RAM	Reliability, Availability, and Maintainability
RASP	RApid Scenario Prototype
RCS	Radar Cross Section
RDEC	Research, Development, and Engineering Center
RDT&E	Research, Development, Test & Evaluation
RF	Radio Frequency
RFI	Requests for Information
RFP	Request for Proposal
RFT	Requests for Allied Paricipantions in Tests
RKV	Redesigned Kill Vehicle
RMF	Risk Management Framework
RTS	Ronald Reagan Test Site, Kwajalein, Marshall Islands
RV	Reentry Vehicle
S	
SAP	Special Access Programs
SATCOM	Satellite Communications
SBIR	Small Business Innovative Research;
SBIR/STTR	Small Business Innovative Research/Small Business Technology Transfer
SBIRS	Space Based Infrared System; Space-Based Infrared Sensors
SBS	Sea Based Systems
SBT	Sea Based Terminal
SBX	Sea Based Test X-Band Radar
SCA	Security Controls Assessment
SCADA	Supervisory Control And Data Acquisition
SCARE	Software Change Analysis Review Environment
SCG	Security Classification Guides
SCN	System Change Notices
SCN	Specification Change Notices
SCOUT	Simultaneous Correlation of Unambiguous Tracks
SCR	SM-3 Cooperative Development; System Capability Review
SCRM	Supply Chain Risk Management
SDA	Space Domain Awareness
SDR	System Design Review; Software Design Review
SE&I	Systems Engineering and Integration
SECDEF	Secretary of Defense
SEI	Systems Engineering & Integration
SGP	Super Green Pine
SIAO	Senior Information Assurance Officer
SIAO/CA	Senior Information Assurance Officer (SIAO)/Certification Authority (CA)
SIGNIT	Signal Intelligence
SIPRNET	Secret Internet Protocol Router Network
SITR	System Engineering, Integration, Test, and Readiness
SIU	Simulation Interface Units
SIV	Silo Interface Vault
SKA	Space-based Kill Assessment
SM	Standard Missile
SM-3	Standard Missile -3
SMAC	Shot Management Analysis Cell
SMDC	Space and Missile Defense Command, U.S. Army
SMDC/ARSTRST	Space and Missile Defense Command/Army Forces Strategic Command
SME	Subject Matter Expert
SNL	Sandia National Lab
SOI	Space Object Identification
SPAWAR	Naval Space and Warfare Command; Space and Naval Warfare Systems Command
SPFR	System Post Flight Reconstruction
SPMT	System Pre Mission Test

ACRONYMS	DEFINITION
SpOC	Space Operations Command
SPPN	Special Purpose Processing Node
SPS	Standard Procurement System
SRBM	Short-Range Ballistic Missiles
SRBMD	Short Range Ballistic Missile Defense
SRP	Stockpile Reliability Program
SRR	System Requirements Review; Software Readiness Review
SS/CPAF	Soul Source/ Cost Plus Award Fee
SS/CPFF	Soul Source/ Cost Plus Fixed Fee
SSA	Space Situational Awareness
SSC	System Security Concept
SSF	Single Stimulation Framework
SSL	Space Sensor Layer
STEM	Science, Technology, Engineering, and Mathematics
STOC	System Test and Operations Center
STRATCOM	Strategic Command
STSS	Satellite Tracking and Surveillance System; Space Tracking and Surveillance System
STTR	Small Business Technology Transfer
SWDC	Specialized Warfighter Development Contract
SWES	Software Evaluation Station
SWIR	Software Increment Reviews
SWUP	Software Upgrade
SYMP	Symposium
T	
T&E	Test and Evaluation
TACAIR	Tactical Air
TC	Targets and Countermeasures

THIS PAGE INTENTIONALLY LEFT BLANK

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 3: *Advanced Technology Development (ATD)*					R-1 Program Element (Number/Name) PE 0603176C *I Advanced Concepts and Performance Assessment*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	70.034	45.852	49.410	15.800	-	15.800	-	-	-	-	-	-
MD71: *Advanced Concepts and Performance Assessments*	67.010	11.256	21.137	12.250	-	12.250	-	-	-	-	-	-
MD40: *Program-Wide Support*	3.024	0.605	0.592	0.607	-	0.607	-	-	-	-	-	-
MC71: *Cyber Operations*	-	33.991	27.681	2.943	-	2.943	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

Decrease from FY 2021 to FY 2022 reflects the FY 2021 Congressional adds for cybersecurity of left and right of launch, cyber operations, and hypersonic kill vehicle hardware-in-the-loop testbed.

A. Mission Description and Budget Item Justification

The Advanced Concepts and Performance Assessment (ACPA) Program Element delivers an integrated government concept definition, simulation, analysis, and testbed capability. ACPA's focus is on the exploration of novel and/or emerging capabilities that may have the potential to enhance the Missile Defense System (MDS). ACPA centralizes assessment of advanced missile defense technology and delivers insight into the performance of proposed concepts extending the Missile Defense Agency's (MDA) ability to address evolving threats for the Warfighter.

Subject Matter Experts (SMEs) provide independent assessments of government, university, and industry technology concepts, used in concert with systems engineering requirements, to support acquisition strategy decisions and define technology focus areas. The innovative structured concept definition and assessment methodology enables MDA to quickly validate focus areas, verify contractor technology solutions, and evaluate promising concepts in future MDS architectures. This methodology significantly enhances MDA's ability to assess technology concepts while decreasing the cost of development by:

- Delivering Independent model-based simulations of industry technology concepts to inform the systems engineering process
- Quantifying expectations through algorithms, digital simulation, hardware-in-the-loop, and/or demonstration events prior to expensive live fire test events
- Executing end-to-end testing of technology concepts integrated with weapon systems through Command and Control (C2) network architectures

Performance assessment of advanced concepts is the key enabler for Government evaluation of concepts in the earliest stages of technology development and maximizes the efficiency of technology investments. Performance assessment is used to quantify capability expectations of innovative concepts to counter the expanding regional and homeland missile threats, including ballistic and cruise missiles, and hypersonic vehicles.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603176C *I Advanced Concepts and Performance Assessment*

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	46.201	14.910	15.178	-	15.178
Current President's Budget	45.852	49.410	15.800	-	15.800
Total Adjustments	-0.349	34.500	0.622	-	0.622
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	34.500			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.349	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	0.000	0.000	0.622	-	0.622

Change Summary Explanation

Increase in FY 2021 provides Congressional adds for cybersecurity of left and right of launch, cyber operations, and hypersonic kill vehicle hardware-in-the-loop testbed.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603176C / *Advanced Concepts and Performance Assessment*	Project (Number/Name) MD71 / *Advanced Concepts and Performance Assessments*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD71: *Advanced Concepts and Performance Assessments*	67.010	11.256	21.137	12.250	-	12.250	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2021 to FY 2022 reflects the FY 2021 Congressional add of $9.5 million for hypersonic kill vehicle hardware-in-the-loop testbed.

A. Mission Description and Budget Item Justification

Advanced Concepts and Performance Assessments (ACPA) centralizes advanced technology concept modeling, simulation, software, and analysis. Integrating models of promising disruptive technical solutions into Missile Defense System (MDS) system-level simulations enables leadership to make data driven acquisition and technology investment decisions. Concepts that improve or adapt existing systems, that incorporate mobile sensors and interceptors that can be surged into zones of crisis or conflict are also deemed disruptive. Examples of efforts required to quantify the contribution of disruptive technologies may include, but not be limited to environmental experimentation and phenomenological characterization required for new sensor concepts, advanced weapon technologies, and emerging directed energy concepts. Using a technology development testbed approach, ACPA enables assessment and characterization of incremental technology improvements to inform requirements and evaluate missile defense elements, components, and/or sub-component technologies.

Coupled with characterization efforts, ACPA develops innovative left-through-right-of-launch modeling capabilities including physics-based representations in the areas of cyber, sensor technologies, lethality and survivability, communications, and sensor support. ACPA is focusing on Science and Technology initiatives which increase interoperability and leverages expertise with Allied and Service partners.

ACPA capitalizes on the innovation of small businesses, universities, Federally Funded Research and Development Centers (FFRDCs), and University Affiliated Research Centers (UARCs) to pursue a broad range of hardware, software, models, algorithms, trade studies, and analysis. These innovations bring together government developed models representing existing and future missile defense architectures, technology concepts, and advanced algorithms to provide detailed assessments of concept performance and inform investment decisions. These innovations, combined with a robust high performance computing infrastructure, provide a unique in-house government capability to demonstrate and assess technology concepts for emerging technology risk reduction, to mature concepts with laboratory, ground, and flight test data, and where possible, apply concepts in simulated exercises with weapon systems across representative communication architectures.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Advanced Concepts and Performance Assessment	11.256	11.637	12.250
Articles:	-	-	-
Description: Provide quantitative assessments that define the benefits of technology investments and inform requirements using an integrated concept definition, simulation, and performance analysis capability. A staff of diverse Subject Matter Experts			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603176C / *Advanced Concepts and Performance Assessment*	**Project (Number/Name)** MD71 / *Advanced Concepts and Performance Assessments*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
(SMEs) delivers independent government performance evaluations which exercise kinetic and non-kinetic missile defense concept representations against the broad spectrum of evolving threats. - Assess electro-optical infrared and advanced sensor technologies and quantify impacts on MDS - Provide independent government assessments of industry sensor, directed energy and weapon system technology concepts - Evaluate lethality impacts and weapons effectiveness of emerging concepts - Examine pathfinder solutions and demonstrate the utility of directed energy for missile defense - Study on-orbit satellite capabilities and contribution to defense against advanced threats - Assess and identify promising intercept capabilities across all phases of flight - Perform concept performance against emerging advanced threats including hypersonic threat testing scenarios - Mature advanced technology concepts in a testbed environment and through lab, ground, and flight demonstrations - Apply concepts in simulated exercises with weapon systems - Work with the MDS Architect and Missile Defense Agency (MDA) Systems Engineer to design concepts, build models and assess technology concepts' contributions to future MDS architectures - Develop and extend modeling techniques, including incorporation of artificial intelligence - Focus research and engineering activities from university and small business partners to identify suitable technology and concepts that improve MDS performance through a rapid innovation model based on an engineering test bed - Assess multi-domain data fusion concept for current or future weapon systems. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** See Above ***FY 2022 Plans:*** See Above ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Hypersonic Hardware-in-the-Loop	0.000	9.500	0.000
Articles:	-	-	-
Description: Develop an independent government hypersonic testbed supporting assessment and maturation of industry and/or government technology approaches. Leverage existing facilities and extend ballistic/hypersonic kill vehicle hardware-in-the-loop (HWIL) by integrating with evolving hypersonic sensor HWIL capabilities. Provide a prototype platform consisting of technologies			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603176C / *Advanced Concepts and Performance Assessment*	**Project (Number/Name)** MD71 / *Advanced Concepts and Performance Assessments*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
necessary to evaluate the potential of new kill vehicle concepts to identify, track, and engage emerging threats; including vehicles with dynamically changing aerothermal signatures. Assess, mature, and integrate high-fidelity environmental truth models and/or representations for aerothermal, aero-optics and/or jet interaction for hypersonic flight environments to provide accurate simulations for digital scene injections into kill vehicle concept representations in HWIL facilities. Bolster prototype development and maturation by upgrading hypersonic HWIL capabilities through pathfinder process integrating agile continuous integration/continuous delivery capabilities. ***FY 2021 Plans:*** See Above ***FY 2022 Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the FY 2021 Congressional add of $9.5 million for hypersonic kill vehicle hardware-in-the-loop testbed.			
Accomplishments/Planned Programs Subtotals	11.256	21.137	12.250

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603180C: *Advanced Research*	27.166	35.024	21.466	-	21.466	-	-	-	-	-	-
• 0603294C: *Common Kill Vehicle Technology*	13.319	11.058	0.000	-	0.000	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

Employ various contracting strategies in a flexible manner to maximize the contribution to MDA. Execute through utilization of small businesses, leverage the Nation's engineering centers of excellence (FFRDCs and UARCs); generate cooperatives with other Government Agencies to provide concept modeling and assessment capability. This strategy uses agency and partner SMEs and government model-based assessments to inform Better Buying Power acquisition decisions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603176C / *Advanced Concepts and Performance Assessment*	Project (Number/Name) MD40 / *Program-Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program-Wide Support*	3.024	0.605	0.592	0.607	-	0.607	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603176C / *Advanced Concepts and Performance Assessment*	Project (Number/Name) MC71 / *Cyber Operations*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MC71: *Cyber Operations*	-	33.991	27.681	2.943	-	2.943	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2021 to FY 2022 reflects the FY 2021 Congressional adds for cybersecurity of left and right of launch and cyber operations.

A. Mission Description and Budget Item Justification

This project supports the monitoring and tracking of Cybersecurity mitigations as required in the Department of Defense (DoD) Instruction Number 8510.01, as amended which establishes Risk Management Framework (RMF) requirements for DoD Information Technology (IT). Funds in this project implement and sustain DoD-required RMF and associated Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments and reviews of proposed Program Manager/Information Assurance System Security Manager (ISSAM) Plans of Action and Milestones for enabling modeling and simulation mission systems. This project captures the RMF documentation (artifacts, validation results, Information Assurance (IA) risk assessment results, and MDA authorizing official and chief information officer accreditation decisions) into the Defense Information Systems Agency's Enterprise Mission Assurance Support Service system. Hardware and software upgrades required to meet DoD standards are supported by funding in this project. Independent verification and validation team actions ensure the availability, integrity, authentication, confidentiality and non-repudiation of the MDA mission, test and administrative systems. Activities in the project are necessary to comply with the Federal Information Security Management Act.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Information Assurance / Cyber Network Defense	33.991	27.681	2.943
Articles:	-	-	-
Description: Funds Risk Management Framework (RMF), network defense, and information technology requirements including: - Conduct cybersecurity/IA engineering and architecture planning - Maintain hardware/software currency to meet DoD-mandated cybersecurity requirements - Support monitoring and tracking of Cybersecurity mitigations detailed in IT security plan of action and milestones (POAM) - Develop DoD RMF certification and accreditation packages - Conduct controls validation testing of systems and to provide POAM to mitigate IA deficiencies - Conduct annual IA reviews to assess compliance in implementing and maintaining IA controls Specific and/or unique accomplishments to each FY are as follows:			
FY 2021 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603176C / *Advanced Concepts and Performance Assessment*	**Project (Number/Name)** MC71 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
See Above ***FY 2022 Plans:*** See Above ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the FY 2021 Congressional adds for cybersecurity of left and right of launch and cyber operations.			
Accomplishments/Planned Programs Subtotals	33.991	27.681	2.943

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*					R-1 Program Element (Number/Name) PE 0603180C / *Advanced Research*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	151.042	27.166	35.024	21.466	-	21.466	-	-	-	-	-	-
MD25: *Advanced Technology Development*	147.523	26.285	34.282	20.635	-	20.635	-	-	-	-	-	-
MD40: *Program-Wide Support*	3.519	0.881	0.742	0.831	-	0.831	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

Decrease from FY 2021 to FY 2022 reflects the FY 2021 Congressional adds for adaptive optics, high-speed flight experiment testing, domestic supply of strategic metals, and a portion of the undistributed Congressional add to restore the Defense Wide Review Missile Defense Agency manpower reduction. FY 2022 is a return to baseline funding levels.

A. Mission Description and Budget Item Justification

The Advanced Research program conducts leading edge advanced research and development to create and enable future missile defense capabilities. The Missile Defense Agency (MDA) executes this mission by capitalizing on the creativity and innovation of the brightest minds in our Nation's universities; small and large businesses; national laboratories; and collaborative research partnerships between allied countries, academic institutions, and industry. In accordance with identified Agency requirements and Warfighter needs, the program assesses and demonstrates the utility of emerging component technologies. After successful maturation and demonstration activities, the program facilitates transition of the technologies to the Missile Defense System through a Commercialization and Transition Office and other MDA programs.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	27.674	18.687	18.883	-	18.883
Current President's Budget	27.166	35.024	21.466	-	21.466
Total Adjustments	-0.508	16.337	2.583	-	2.583
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	16.337			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.508	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	0.000	0.000	2.583	-	2.583

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603180C *I Advanced Research*

Change Summary Explanation

Increase in FY 2021 provides Congressional adds for adaptive optics, high-speed flight experiment testing, domestic supply of strategic metals, and a portion of the undistributed Congressional add to restore the Defense Wide Review Missile Defense Agency manpower reduction.

Increase in FY 2022 provides continued sustainment of program manpower level that Congress restored in FY 2021 enactment.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603180C / *Advanced Research*	Project (Number/Name) MD25 / *Advanced Technology Development*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD25: *Advanced Technology Development*	147.523	26.285	34.282	20.635	-	20.635	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2021 to FY 2022 reflects the FY 2021 Congressional adds for adaptive optics, high-speed flight experiment testing, and a portion of the undistributed Congressional add to Defense Wide Review Missile Defense Agency manpower reduction. FY 2022 is a return to baseline funding level.

A. Mission Description and Budget Item Justification

The Missile Defense Agency's (MDA) Advanced Technology Development Project pursues a broad range of emerging technologies targeted for application and insertion into the Missile Defense System (MDS). MDA explores potential new MDS capabilities by leveraging the creativity and innovation of the Nation's industry, universities, and national laboratories to conduct advanced technology development. MDA also pursues advanced technology development through cooperative international research agreements between U.S. and foreign universities of allied nations. The program manages the selection process and administers the Missile Defense Small Business Innovation Research (SBIR) program element (PE), 0605502C. SBIR topics and projects are selected annually based on needs across the MDS and executed in partnership with sponsoring intra-agency organizations. These mechanisms foster a cooperative environment between small businesses, prime contractors, and MDA elements to yield reduced cost and increased returns on investment for successful technology integration efforts.

MDA's Advanced Technology Development Project assesses the feasibility and technical performance of the advanced research and development efforts through in-house means and partnerships with Department of Defense and other government agency laboratories. MDA provides independent assessments, demonstration and experimentation environments, and other concept assessment capabilities. The output of the experimentation, demonstration, and laboratory efforts provide risk, transition feasibility, and performance assessments, concept assessment data and analysis, and an overall improvement in the state-of-the-art of advanced technology evaluation. The culmination of research, development, and assessment is the commercialization and transition of promising technologies into the MDS.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Advanced Research	26.285	34.282	20.635
Articles:	-	-	-
Description: This activity funds technology and research initiatives executed through continuous cycles of development, maturation, and assessment of component technologies identified by emerging weapon and sensor system concepts. Recurring tasks include: - Conduct systems engineering, integration, research, and materiel solution analysis to identify initiatives and technology to include missiles, sensors, and command and control components in the defense against current and future threats - Pursue advanced technology investments for defense against ballistic and non-ballistic hypersonic threats			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603180C / *Advanced Research*	**Project (Number/Name)** MD25 / *Advanced Technology Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Develop breakthrough technology and innovative solutions from private industry, qualified accredited educational institutions, and non-profit organizations to include: -- Additive manufacturing technology initiatives for interceptor propulsion and structural components -- Materials development, assessment, and processing techniques -- Advanced threat component technologies -- Electro-optical and infrared sensor and communication systems -- Radar and radio frequency communication systems -- Interceptor and space systems component technologies -- Left through right of launch integration - Assess and evaluate advanced technology investments to extract risk-reduction information and determine transition feasibility - Execute the Broad Agency Announcement addressing breakthrough technologies and innovative solutions from private industry, qualified accredited educational institutions, and non-profit organizations to include: -- Artificial intelligence related to machine learning, big data, and Decision Theory -- Computer Science, Signal and Data Processing -- Directed energy technology -- Future MDS concept development -- Kill Web Algorithms, Probability and Decision Theory -- Modeling and simulation (M&S) -- Radar and radio frequency sensor systems -- Phenomenology - Utilize NanoSat technology demonstrations to conduct testing and reduce risk for new and advanced technologies for the MDS - Leverage university research opportunities including allied nations to enhance MDS advanced technology initiatives and build stronger relationships with allies and partners - Manage the selection process of SBIR and technology application programs to assist MDA funded technology developers in finding and entering technology transfer opportunities to missile defense applications Specific and/or unique accomplishment to each FY are as follows: ***FY 2021 Plans:*** - NanoSat Testbed Initiative: provide risk reduction in the development of new and advanced technologies, in support of the MDS, by testing and demonstrating capabilities under realistic environmental conditions - Mature component technology and reduce technology risk using sounding rockets to demonstrate interceptor technology in a relevant environment			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603180C / *Advanced Research*	**Project (Number/Name)** MD25 / *Advanced Technology Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- High Temperature Seeker Window Development: Mature and evaluate seeker windows that support existing and future missions. ***FY 2022 Plans:*** - Assess incoming innovative technology whitepapers and pursue awards for those that align with Agency priorities and budget - NanoSat Testbed Initiative: collect and analyze on-orbit mission data from communication architectures experiments, initiate next series of experimentation focused on improved engagement management techniques - High Temperature Seeker Window Assessment: Mature and evaluate seeker windows that support existing and future missions. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the FY 2021 Congressional adds for adaptive optics, high-speed flight experiment testing, domestic supply of strategic metals, and a portion of the undistributed Congressional add to restore the Defense Wide Review Missile Defense Agency manpower reduction. FY 2022 is a return to baseline funding levels.			
Accomplishments/Planned Programs Subtotals	26.285	34.282	20.635

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603176C: *Advanced Concepts and Performance Assessment*	45.852	49.410	15.800	-	15.800	-	-	-	-	-	-
• 0603294C: *Common Kill Vehicle Technology*	13.319	11.058	0.000	-	0.000	-	-	-	-	-	-
• 0604181C: *Hypersonic Defense*	386.528	272.632	247.931	-	247.931	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The acquisition strategy to conduct these technology development agreements consists of partnering with accredited universities, small businesses, and nonprofit organizations. MDA awards competitive procurements via the MDA Science and Technology Advanced Research Broad Agency Announcement (BAA); the Advanced Technology Innovation BAA; the Small Business Innovative Research and the Small Business Technology Transfer program.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603180C / *Advanced Research*	Project (Number/Name) MD40 / *Program-Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program-Wide Support*	3.519	0.881	0.742	0.831	-	0.831	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency												Date: May 2021
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 3: *Advanced Technology Development (ATD)*					R-1 Program Element (Number/Name) PE 0603294C *I Common Kill Vehicle Technology*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	312.220	13.319	11.058	0.000	-	0.000	-	-	-	-	-	-
MD85: *Common Kill Vehicle Technology*	303.217	10.660	10.619	0.000	-	0.000	-	-	-	-	-	-
MD40: *Program Wide Support*	9.003	2.659	0.439	0.000	-	0.000	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

Decrease from FY 2021 to FY 2022 reflects a shift in Department of Defense priorities. The Department is cancelling the development of Common Kill Vehicle Technologies (CKV) beginning in FY 2022. Weapon systems technology efforts are available for the Next Generation Interceptor (NGI) program and some of those technologies were transitioned to the winning NGI contractors. These technologies remain available for potential application to other future interceptor programs. CKV technology research efforts included maturation of advanced weapon technologies for current weapon systems concepts (e.g., Aegis, Terminal High Altitude Area Defense (THAAD), Ground Based Midcourse, Defense (GMD)) and advance concepts and designs to mature technology for end-to-end weapon systems and components up to prototypes.

A. Mission Description and Budget Item Justification

The weapon systems technology maturation efforts under the Common Kill Vehicle program element are complete.

The Missile Defense Agency (MDA) pursued multiple component risk reduction efforts for weapon technologies that will enable advanced concepts and designs to mature technology for end-to-end weapon systems and components up to prototypes.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	13.600	11.058	10.996	-	10.996
Current President's Budget	13.319	11.058	0.000	-	0.000
Total Adjustments	-0.281	0.000	-10.996	-	-10.996
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.281	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency					Date: May 2021
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 3: *Advanced Technology Development (ATD)*		R-1 Program Element (Number/Name) PE 0603294C *I Common Kill Vehicle Technology*			
• Other Adjustment	0.000	0.000	-10.996	-	-10.996

Change Summary Explanation

Decrease in FY 2022 reflects a shift in Department of Defense priorities. The Department is cancelling the development of Common Kill Vehicle Technologies beginning in FY 2022.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603294C / *Common Kill Vehicle Technology*	Project (Number/Name) MD85 / *Common Kill Vehicle Technology*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD85: *Common Kill Vehicle Technology*	303.217	10.660	10.619	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2021 to FY 2022 reflects a shift in Department of Defense priorities. The Department is cancelling the development of Common Kill Vehicle Technologies beginning in FY 2022.
The weapon systems technology efforts will transfer to industry with potential application to the Next Generation Interceptor program as well as future interceptor programs.

A. Mission Description and Budget Item Justification

The Common Kill Vehicle (CKV) program enhanced weapon system performance to enable the Warfighter to counter numerous and complex threats by establishing the technological foundation for improving current and future systems. The Missile Defense Agency developed next generation kill vehicle concepts and technology based on a modular open systems architecture designed to common interfaces and standards making upgrades easier and enabling a more competitive, broader supplier industrial base.
CKV technology research efforts included maturation of advanced weapon technologies for current weapon systems concepts (e.g., Aegis, Terminal High Altitude Area Defense (THAAD), Ground Based Midcourse, Defense (GMD)) and advance concepts and designs to mature technology for end-to-end weapon systems and components up to prototypes. The CKV program efforts were well integrated with the Missile Defense System (MDS) architecture.

The weapon systems technology maturation efforts under the CKV program element are complete.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Common Kill Vehicle	10.660	10.619	0.000
Articles:	-	-	-
Description: CKV research efforts included maturation of advanced weapon technologies for current weapon systems concepts including Aegis, THAAD, Ground based Missile Defense, and advance concepts and designs to mature technology for end-to-end weapon systems and components up to concept prototypes.			
Specific and/or unique accomplishments to each FY are as follows:			
FY 2021 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603294C / *Common Kill Vehicle Technology*	**Project (Number/Name)** MD85 / *Common Kill Vehicle Technology*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Develop weapon system concepts, identify key technology gaps, and develop and test technologies necessary to the successful requirements validation and technology risk reduction of advanced MDS weapon systems. ***FY 2022 Plans:*** No funding is requested in FY 2022 for this effort. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The decrease from FY 2021 to FY 2022 reflects a shift in Department of Defense priorities. The Department is cancelling the development of Common Kill Vehicle Technologies beginning in FY 2022.			
Accomplishments/Planned Programs Subtotals	10.660	10.619	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603176C: *Advanced Concepts and Performance Assessment*	45.852	49.410	15.800	-	15.800	-	-	-	-	-	-
• 0603180C: *Advanced Research*	27.166	35.024	21.466	-	21.466	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The full acquisition strategy consisted of three focus areas. First, through competition with industry, develop weapon system architectures and interfaces with competitive design for improvements to current and future weapon systems. Second, conduct risk reduction activities to identify and mature the technology necessary to increase the reliability and performance of our weapon systems using the Advanced Technology Innovation Broad Agency Announcement and competitive development. Make investments that mitigate the component technology gaps for current and future weapon systems that enhance the competitive environment. Third, leverage the technical expertise of Federally Funded Research and Development Centers, University Applied Research Centers, and Universities and government laboratories to independently develop reference concepts using proven modeling and analysis techniques.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603294C / *Common Kill Vehicle Tech nology*	Project (Number/Name) MD40 / *Program Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program Wide Support*	9.003	2.659	0.439	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year. No funding is requested for Program Wide Support in the Common Kill Vehicle Technology Program Element beginning in FY 2022.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	2.659	0.439	0.000
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment,			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603294C / *Common Kill Vehicle Technology*	**Project (Number/Name)** MD40 / *Program Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** No funding is requested for Program Wide Support in the Common Kill Vehicle Technology Program Element beginning in FY 2022. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects elimination of the Common Kill Vehicle program element funding.			
Accomplishments/Planned Programs Subtotals	2.659	0.439	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 0603881C / *Ballistic Missile Defense Terminal Defense Segment*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	2,373.928	295.312	312.317	277.949	-	277.949	-	-	-	-	-	-
MD07: *THAAD*	1,953.852	185.483	259.923	251.192	-	251.192	-	-	-	-	-	-
MC07: *Cyber Operations*	18.761	15.037	9.806	11.977	-	11.977	-	-	-	-	-	-
MD06: *Patriot Advanced Capability-3 (PAC-3)*	297.424	86.767	26.198	1.226	-	1.226	-	-	-	-	-	-
MD40: *Program-Wide Support*	103.891	8.025	16.390	13.554	-	13.554	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

Decrease from FY 2021 to FY 2022 reflects the completion of Software Build 4.0 THAAD/Missile Segment Enhancement (MSE) Integration Part 1 (JEON).

A. Mission Description and Budget Item Justification

The Ballistic Missile Defense (BMD) Terminal Defense Segment provides vital forward-deployable capabilities to support regional defensive Missile Defense System (MDS) operations. The Terminal High Altitude Area Defense (THAAD) system provides Combatant Commands (CCMD) a globally-transportable, rapidly-deployable capability to intercept and destroy short-range, medium-range, and limited intermediate-range missile threats inside or outside the atmosphere during terminal phase of flight. This Program Element investigates concepts and continues the development and integration of multiple, independent THAAD software upgrades to address the evolving threat, improve warfighter's defense planning, and improve capabilities to engage short-range ballistic missile (SRBM), medium-range ballistic missile (MRBM), and limited intermediate-range ballistic missile (IRBM) threats.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	306.761	412.627	340.071	-	340.071
Current President's Budget	295.312	312.317	277.949	-	277.949
Total Adjustments	-11.449	-100.310	-62.122	-	-62.122
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-102.500			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	2.190			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-7.557	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	-3.892	0.000	-62.122	-	-62.122

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0603881C *I Ballistic Missile Defense Terminal Defense Segment*

Change Summary Explanation

Decrease of $102.5 million in FY 2021 reflects Congressional reduction for THAAD underlay lack of validated requirement and acquisition strategy [Concept of Operations (CONOPS) development and analysis only].

Increase of $2.2 million in FY 2021 provides a portion of the undistributed Congressional add to restore Defense Wide Review (DWR) Missile Defense Agency manpower reduction.

Decrease of $62.1 million in FY 2022 reflects reduced requirement for the THAAD Layered Homeland Defense effort and efficiencies.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	Project (Number/Name) MD07 / *THAAD*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD07: *THAAD*	1,953.852	185.483	259.923	251.192	-	251.192	-	-	-	-	-	-
Quantity of RDT&E Articles	50	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2021 to FY 2022 reflects the completion of Software Build 4.0 THAAD/MSE Integration Part 1 (JEON).

A. Mission Description and Budget Item Justification

The THAAD system provides a capability to intercept and destroy short-range, medium-range, and limited intermediate-range missile threats inside or outside the atmosphere during the terminal phase of flight. THAAD continues the development and integration of multiple, independent software upgrades to address the evolving threat, improve the Warfighter's defense planning, and improve capabilities to engage SRBM, MRBM, and limited IRBM threats.

THAAD Development continues the development and integration of multiple, independent software builds to deliver enhanced system capabilities and expand the defense of allies and deployed forces from short-to-intermediate-range threats.

Program Operations provides strategic planning, program integration, cost estimating, contracting, financial management, internal reviews and audits, earned-value management and program assessments for the THAAD Program Office.

JEON provides enhanced capability against specific threats by expanding engagement options and increasing coverage areas.

Project Redwood details are provided at a Higher Classification reported in accordance with Title 10, United States Code, Section 119 (a)(1) in the Special Access Program Annual Report to Congress.

THAAD Program Support provides support for communications and interoperability efforts to operate on multiple networks and safety and mission assurance efforts in support of the Materiel Release process.

THAAD Layered Homeland Defense effort supports the demonstration of weapon system and interceptor improvements to enhance THAAD capabilities against evolving threats. This effort will leverage the existing design improvement activities and develop software and hardware enhancements that demonstrate THAAD capabilities for regional and homeland applications. Demonstrations will be performed both at the component level and a flight test.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Terminal High Altitude Area Defense (THAAD) Development	93.677	156.894	126.217
Articles:	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	**Project (Number/Name)** MD07 / *THAAD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Description: The THAAD Development program continues the development and integration of multiple, independent software builds to deliver enhanced system capabilities and expand the defense of allies and deployed forces from short-to-intermediate-range threats. Software Build 4.0: THAAD/Missile Segment Enhancement (MSE) Integration Part 1 (JEON) (scheduled to be completed in 4QFY2021) - Initial requirements to integrate MSE launchers and missiles into the THAAD weapon system enabling a more tightly integrated upper/lower tier defensive capability in support of JEON. - Improved capability to engage short-range ballistic missile (SRBM), medium-range ballistic missile (MRBM) and limited intermediate-range ballistic missile (IRBM) threats capable of creating complex scenes. - Expanded requirements for THAAD Electronic Protection/Objective Debris Mitigation to provide radar enhancements improving performance against adverse environments. Software Build 4.1: Global Materiel Release Updates for Expanded THAAD (scheduled to be completed in 2QFY2023) - Cybersecurity: Implements additional cybersecurity updates to improve cyber posture required to ensure continuity of Authority to Operate approvals. - Interface Change Proposal: Implements necessary Link-16 software interface changes to align with MDS interoperability. - Radio Frequency (RF) Remote Launcher: Develops software capability for RF remote launcher capability. - Army Navy/Transportable Radar Surveillance and Control (AN/TPY-2) Radar: Integrates latest AN/TPY-2 radar software (CX 5.0) into THAAD weapon system which ensures system functionality and interoperability providing the capability to track and discriminate evolving threats. - Maintenance Updates: Provides required maintenance updates and implements deferred content from accelerated JEON fielding timelines. - External Integration: Project Manager for Short and Intermediate Effectors for Layered Defense (PM SHIELD) integration and support. Software Build 5.0: THAAD Updates to Maintain Mission Assurance (scheduled to be completed in 1QFY2025) - MSE Safety Integration: Integrates additional MSE safety improvements and the ability to manually emplace MSE Launcher. - External Integration: PM SHIELD integration and support. - Configuration 3 system Integration and Cyber Modernization: Updates THAAD weapon system to integrate new hardware addressing obsolescence, cyber vulnerabilities and various supportability issues to ensure continuity of Authority to Operate (ATO) approvals. - RF Remote Launcher: Hardware Integration for increased defended area footprints via THAAD Remote Launcher Part 2.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	**Project (Number/Name)** MD07 / *THAAD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Architecture Improvements: Improvements in Software and Hardware Architecture to increase modularity, interoperability and reduce obsolete software and architecture structures. - Full Active Sensor Bias Monitoring and Reporting: Provide MDS system with bias monitoring and reporting data to support correlation and integration of Ballistic Missile Defense (BMD) System Track and other future techniques. - Assured Position Navigation and Timing (APNT): Implement protective measures that increase assurance of reliable PNT data. APNT supports a Department of Defense mandate to ensure the integrity and availability of PNT data for the THAAD weapon system. - Remote Workstation: External THAAD Fire Control and Communication (TFCC) hardware and software connectivity allowing for the capability to remote from the TFCC tactical shelter to a remote location. - Dual Monitor: Integrate Dual Monitor capabilities for the ability to provide human factor improvements through additional monitor viewing space to be utilized within the TFCC and in support of Remote Workstation capability to support external Tactical Operation Centers (TOCs) and other external Remote Workstations. Recurring efforts include: - Support element Models and Simulations (M&S) related activities, to include Verification, Validation and Accreditation (VV&A) and Continuous Digital Assessment (CDA) on the path of accredited models and simulations for MDS assessment. - Support M&S related activities in element and MDS test events in the approved Integrated Master Test Plan (IMTP) such as requirements, design, development, and VV&A. - Design, develop, test, and field the releases of THAAD system software to ensure continued performance and operation of fielded batteries. - Provide software updates in support of the incremental evolution of performance upgrades. - Support laboratory assets and equipment to enable future development, and to isolate, identify, and remedy root causes of equipment and software deficiencies identified by the warfighter. - Perform requirements development, engineering analysis, and performance verification for THAAD development and MDS integration to ensure THAAD compliance with the MDS Specification, MDS System Description Document, and Master Integration Plan. - Participate in Missile Defense Agency (MDA) and Army studies to determine the architecture and integration of the THAAD Weapon system into the Integrated Air and Missile Defense (IAMD) Battle Command System (IBCS). - Provide and coordinate analysis, studies and papers to support the resolution of issues and concerns with the integration of the THAAD weapon system into the future Army IBCS architecture. - Development of improved tactical network architecture in order to increase availability, robustness, and security of the system to counter cybersecurity threats.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	**Project (Number/Name)** MD07 / *THAAD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Incremental Development Process to identify THAAD evolution and synchronize requirements that address emerging threat evolution, obsolescence needs, Army training needs, reliability and sustainment issues. - Perform Independent Verification and Validation (IV&V) of software and software assurance risk report. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** Software Build 4.0 Complete development efforts and integration to include the following: - THAAD/MSE Integration (JEON) into the THAAD Weapon System. - Expanded THAAD Electronic Protection/Objective Debris Mitigation. Software Build 4.1 Provides funding to initiate development and integration efforts to include: - Cybersecurity: Implements additional cybersecurity updates to improve cyber posture required to ensure continuity of Authority to Operate (ATO) approvals. - Interface Change Proposal: Implements necessary Link-16 software interface changes to align with MDS interoperability. - RF Remote Launcher: Develops software capability for RF remote launcher capability. - AN/TPY-2 Radar: Integrates latest AN/TPY-2 radar software (CX 5.0) into THAAD weapon system which ensures system functionality and interoperability while providing the capability to track and discriminate evolving threats. - Maintenance Updates: Provides required maintenance updates and implements deferred content from accelerated JEON fielding timelines. - External Integration: PM SHIELD integration and support. Software Build 5.0 Provides funding for development, trade studies and early engineering efforts to include: - MSE Safety Integration: Integrates additional MSE safety capabilities and the ability to manually emplace MSE Launcher. - External Integration: PM SHIELD integration and support. - Configuration 3 system Integration and Cyber Modernization: Updates THAAD weapon system to integrate new hardware addressing obsolescence, cyber vulnerabilities and various supportability issues to ensure continuity of Authority to Operate (ATO) approvals. - Full Active Sensor Bias Monitoring and Reporting: Provide MDS system with bias monitoring and reporting data to support correlation and integration of Ballistic Missile Defense (BMD) System Track and other future techniques.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	**Project (Number/Name)** MD07 / *THAAD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Assured Position Navigation and Timing (APNT): Implement protective measures that increase assurance of reliable PNT data. APNT supports a Department of Defense mandate to ensure the integrity and availability of PNT data for the THAAD weapon system. - Remote Workstation: External THAAD Fire Control and Communication (TFCC) hardware and software connectivity allowing for the capability to remote from the TFCC tactical shelter to a remote location. - Dual Monitor: Integrate Dual Monitor capabilities for the ability to provide human factor improvements through additional monitor viewing space to be utilized within the TFCC and in support of Remote Workstation capability to support external Tactical Operation Centers (TOCs) and other external Remote Workstations. - Architecture Improvements: Improvements in Software and Hardware Architecture to increase modularity, interoperability and reduce obsolete software and architecture structures.			
FY 2022 Plans: Software Build 4.1 Provides funding to continue development and integration efforts to include: - Cybersecurity: Implements additional cybersecurity updates to improve cyber posture required to ensure continuity of Authority to Operate (ATO) approvals - Interface Change Proposals: Implements necessary Link-16 software interface changes to align with MDS interoperability - RF Remote Launcher: Develops software capability for RF remote launcher capability - AN/TPY-2 Radar: Integrates latest AN/TPY-2 radar software (CX 5.0) into THAAD weapon system which ensures system functionality and interoperability while providing the capability to track and discriminate evolving threats. - Maintenance Updates: Provides required maintenance updates and implements deferred content from accelerated JEON fielding timelines. - External Integration: PM SHIELD integration and support. Software Build 5.0 Provides funding for development and integration efforts to include: - MSE Safety Integration: Integrates additional MSE safety improvements and the ability to manually emplace MSE Launcher. - External Integration: PM SHIELD integration and support. - Configuration 3 system Integration and Cyber Modernization: Updates THAAD weapon system to integrate new hardware addressing obsolescence, cyber vulnerabilities and various supportability issues to ensure continuity of Authority to Operate (ATO) approvals. - RF Remote Launcher: Hardware Integration for increased defended area footprints via THAAD Remote Launcher Part 2. - Architecture Improvements: Improvements in Software and Hardware Architecture to increase modularity, interoperability and reduce obsolete software and architecture structures.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	**Project (Number/Name)** MD07 / *THAAD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Full Active Sensor Bias Monitoring and Reporting: Provide MDS system with bias monitoring and reporting data to support correlation and integration of Ballistic Missile Defense (BMD) System Track and other future techniques. - Assured Position Navigation and Timing (APNT): Implement protective measures that increase assurance of reliable PNT data. APNT supports a Department of Defense mandate to ensure the integrity and availability of PNT data for the THAAD weapon system. - Remote Workstation: External THAAD Fire Control and Communication (TFCC) hardware and software connectivity allowing for the capability to remote from the TFCC tactical shelter to a remote location - Dual Monitor: Integrate Dual Monitor capabilities for the ability to provide human factor improvements through additional monitor viewing space to be utilized within the TFCC and in support of Remote Workstation capability to support external Tactical Operation Centers (TOCs) and other external Remote Workstations. - AN/TPY-2 Radar: Integrates latest AN/TPY-2 radar software (CX 6.0) into THAAD weapon system which ensures system functionality and interoperability providing the capability to track and discriminate evolving threats. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the completion of Software Build 4.0 THAAD/Missile Segment Enhancement (MSE) Integration Part 1 (JEON) and efficiencies.			
Title: Program Operations	44.804	50.054	46.402
Articles:	-	-	-
Description: Program Operations provides strategic planning, program integration, contracting, acquisition, engineering, financial management, internal reviews and audits, and program assessments for the THAAD Program Office. Recurring efforts include: -Provide technical and business management support activities to provide the Program Director with critical program status and decision quality data. -Ensure THAAD program compliance with internal and external direction, policies, and regulations to deliver critical capability within a consistent and disciplined process. -Conduct internal program reviews to measure program progress against the six MDA approved baselines. -Continue a Mission Assurance and Manufacturing Engineering Program to include Quality, Configuration Management, Manufacturing, Engineering, and Safety in all phases of the system life cycle, throughout the supply chain, and at all levels of assembly emphasizing high yield rates which minimize test and rework costs. -Provide Quality Safety and Mission Assurance (QSMA) operations to ensure compliance with Agency requirements for design, test, manufacturing, quality, safety and reliability to ensure high quality products are delivered to the Warfighter.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	**Project (Number/Name)** MD07 / *THAAD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -SEE ABOVE. ***FY 2022 Plans:*** -SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A.			
Title: JEON	33.300	3.200	0.000
Articles:	-	-	-
Description: This accomplishment fully funds the THAAD portion of JEON to deliver expanded engagement options and increased coverage area. This includes accelerating some content previously included in the THAAD Development accomplishment, while adding new development efforts which include Rapid Deployment of Command and Control and Software upgrades and Performance Optimization Against Additional Threats as well as the following three new priorities: 1) U.S. Army's Phased Array Tracking Radar Intercept on Target (PATRIOT) Launch on Remote to utilize THAAD's capability to detect and track threat ballistic missiles at longer ranges. 2) THAAD/MSE Integration Part 1 that integrates MSE launchers and missiles into the THAAD weapon system enabling a more tightly integrated upper/lower tier defensive capability. 3) THAAD Remote Launcher Part 1 that utilizes flexible communication paths to extend the defended area of a THAAD battery. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -Complete THAAD/MSE Integration Part 1 integrating MSE launchers and missiles in to the THAAD weapon system enabling a more tightly integrated upper/lower tier defensive capability. ***FY 2022 Plans:*** -N/A. ***FY 2021 to FY 2022 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	**Project (Number/Name)** MD07 / *THAAD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Decrease from FY 2021 to FY 2022 reflects the completion of Software Build 4.0 - THAAD/Missile Segment Enhancement (MSE) Integration Part 1 (JEON).			
Title: Project Redwood- Details at a Higher Classification	11.930	10.493	12.052
Articles:	-	-	-
Description: This project is reported in accordance with Title 10, United States Code, Section 119 (a)(1) in the Special Access Program (SAP) Annual Report to Congress. ***FY 2021 Plans:*** -SEE ABOVE. ***FY 2022 Plans:*** -SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Further details are reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.			
Title: THAAD Program Support	1.772	2.782	1.954
Articles:	-	-	-
Description: This activity provides support for efforts such as communications and interoperability upgrades to operate on joint, service, or allied communications networks. This activity provides support for safety and mission assurance requirements, and support of independent government offices as part of the Materiel Release process. Recurring efforts include: - Interoperability development and maintenance to ensure the weapon system is authorized to operate on joint, service, or allied communications networks. - Safety confirmation and verification testing, preparation and approvals of System Safety Risk Assessments, issuance of hazard classifications and safety releases, insensitive munitions approvals and waivers, and independent oversight and support in the areas of reliability, availability, and maintainability (RAM) and quality assurance. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	**Project (Number/Name)** MD07 / *THAAD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-SEE ABOVE. ***FY 2022 Plans:*** -SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects manpower efficiencies.			
Title: THAAD Layered Homeland Defense	0.000	36.500	64.567
Articles:	-	-	-
Description: The THAAD Layered Homeland Defense effort supports the demonstration of weapon system and interceptor improvements to enhance THAAD capabilities against evolving threats. This effort will leverage the existing design improvement activities and develop software and hardware enhancements that demonstrate THAAD capabilities for regional and homeland applications. Demonstrations will be performed both at the component level and a flight test.			
FY 2021 Plans: -Conduct THAAD Launch on Remote/Engage on Remote Analysis and Implementation CONOPS with support for IBCS concept planning and analysis. -Conduct THAAD System definition/systems engineering performance assessment and CONOPs studies. -Conduct THAAD Seeker and Image Processing Software Design Analysis/Performance Analysis. -Conduct THAAD Mission Computer Software Architecture and Performance Analysis Studies. -Conduct THAAD Missile Guidance, Control, and Navigation CONOPS and SW Performance Analysis trade studies of kinematic upgrade options. -Conduct THAAD Capability Gap Analysis and Technology Risk Reduction (TRR) efforts to include: Evaluating all potential THAAD concepts against the MDS Gaps and Needs; Weapon System CONOPS Systems Engineering; and Weapon Systems Architecture Trade Study. -Conduct design analysis to identify government-owned lab upgrades for engagement performance analysis to include scene generation and hardware integration.			
FY 2022 Plans: - Execute Rapid Acquisition efforts to develop and demonstrate THAAD interceptor and weapon system performance enhancements and capabilities needed to meet evolving threat requirements identified in the FY 2021 CONOPS and analysis. Leading component enhancements identified in the FY 2021 plans include: - Software development enabling THAAD to use the redesigned 2 color seeker hardware providing the capability to address evolving threat requirements. - Lightweight Kill Vehicle development enabling significant kinematic performance improvements against maneuvering threats.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	**Project (Number/Name)** MD07 / *THAAD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Expanded integration with the MSE interceptor and exploitation of Integrated Air and Missile Defense (IAMD) Battle Command System (IBCS) performance and CONOPS improvements. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides funding to execute Rapid Acquisition efforts to develop and demonstrate hardware and software enhancements to THAAD interceptor and weapon system capabilities needed to meet requirements of the additional threats identified in the FY 2021 CONOPS and analysis and included in the THAAD program.			
Accomplishments/Planned Programs Subtotals	185.483	259.923	251.192

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208866C: MD07: *THAAD O&M*	86.425	89.903	86.828	-	86.828	-	-	-	-	-	-
• 0208866C: MD07: *THAAD Procurement*	407.203	578.335	251.543	-	251.543	-	-	-	-	-	-
• 0603914C: *Ballistic Missile Defense Test*	398.939	365.208	362.906	-	362.906	-	-	-	-	-	-
• 0604876C: *Ballistic Missile Defense Terminal Defense Segment Test*	24.771	1.000	32.697	-	32.697	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The THAAD program awards Indefinite Delivery Indefinite Quantity (IDIQ) Task Orders on the Advanced Capability Development (ACD) contract for THAAD development. The ACD contract is comprised of over 40 separate task orders with varying contract types such as firm fixed price, fixed price incentive firm, cost plus incentive fee, and cost plus fixed fee. The discrete task orders allow management and tracking of development work.

Concept of Operations (CONOPS) development and analysis is on-going to prioritize THAAD enhancements that will support both regional and Layered Homeland Defense capability against validated threats allocated to THAAD. Upon completion of this analysis, THAAD will add tasks as appropriate to the existing ACD contract with Lockheed Martin to develop and demonstrate THAAD interceptor and weapon system performance enhancements and capabilities needed to meet threat requirements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	**Project (Number/Name)** MD07 / *THAAD*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Terminal High Altitude Area Defense (THAAD) Development - Advanced Capability Development	SS/IDIQ	Lockheed Martin : Sunnyvale, CA / Huntsville, AL	869.459	54.592	Nov 2019	111.455	Nov 2020	82.417	Nov 2021	-		82.417	Continuing	Continuing	Continuing
Terminal High Altitude Area Defense (THAAD) Development - IT Program Support	C/CPAF	Northrup Grumman : AL, AK, CA, CO, HI, NM, VA	10.331	2.793	Nov 2019	2.889	Nov 2020	2.819	Nov 2021	-		2.819	Continuing	Continuing	Continuing
Terminal High Altitude Area Defense (THAAD) Development - MDA Program Support	MIPR	Missile Defense Agency (MDA) : Ft. Belvoir, VA/ Huntsville, AL	11.248	1.736	Dec 2019	2.470	Dec 2020	0.000		-		0.000	0.000	15.454	0.000
Terminal High Altitude Area Defense (THAAD) Development - Models & Simulations	MIPR	US Army Combat Capabilities Development Command (CCDC) : Huntsville, AL	244.671	29.943	Dec 2019	29.607	Dec 2020	30.384	Nov 2021	-		30.384	Continuing	Continuing	Continuing
Terminal High Altitude Area Defense (THAAD) Development - Requirements and Design	C/CPAF	Boeing : AL	18.641	2.701	Dec 2019	4.917	Dec 2020	5.797	Dec 2021	-		5.797	Continuing	Continuing	Continuing
Terminal High Altitude Area Defense (THAAD) Development - Software IV&V	MIPR	US Army Combat Capabilities Development Command (CCDC) : Huntsville, Al	0.000	0.000		4.504	Nov 2020	4.131	Nov 2021	-		4.131	Continuing	Continuing	Continuing
Terminal High Altitude Area Defense (THAAD) Development - Software Support (GOVT)	MIPR	US Army Combat Capabilities Development Command (CCDC) : Huntsville, AL	14.147	0.000		0.000		0.000		-		0.000	0.000	14.147	0.000
Terminal High Altitude Area Defense (THAAD) Development - THAAD Radar Improvements	SS/CPAF	Raytheon : MA	10.000	0.000		0.000		0.000		-		0.000	0.000	10.000	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	**Project (Number/Name)** MD07 / *THAAD*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Terminal High Altitude Area Defense (THAAD) Development - Verification and Assessment	C/CPFF	TEAMS SE&I : AL / CO	14.855	1.912	Dec 2019	1.052	Nov 2020	0.669	Nov 2021	-		0.669	Continuing	Continuing	Continuing
JEON - Advanced Capability Development	SS/IDIQ	Lockheed Martin : Sunnyvale, CA / Huntsville, AL	147.789	30.100	Dec 2019	0.000		0.000		-		0.000	0.000	177.889	0.000
JEON - MDA Program Support	Various	MDA : Huntsville, AL	0.509	0.000		0.000		0.000		-		0.000	0.000	0.509	0.000
JEON - OGA JEON Support (GOVT)	MIPR	US Army Tank Automotive Research, Development, and Engineering Center (TARDEC), Army Test and Evaluation Command (ATEC) : Warren, MI / Huntsville, AL	12.959	3.200	Dec 2019	3.200	Dec 2020	0.000		-		0.000	0.000	19.359	0.000
Project Redwood- Details at a Higher Classification - Special Programs	SS/FP	N/A : N/A	95.421	11.930	Nov 2019	10.493	Nov 2020	12.052	Nov 2021	-		12.052	Continuing	Continuing	Continuing
THAAD Layered Homeland Defense - THAAD Layered Homeland Defense	Various	Lockheed Martin / U.S. Army Combat Capabilities Development Command (CCDC) : Sunnyvale, CA / Huntsville, AL	0.000	0.000		36.500	Mar 2021	64.567	Dec 2021	-		64.567	Continuing	Continuing	Continuing
		Subtotal	1,450.030	138.907		207.087		202.836		-		202.836	Continuing	Continuing	N/A

Remarks

N/A.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	Project (Number/Name) MD07 / *THAAD*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Operations - Program Operations	Various	Missile Defense Agency (MDA) : Ft. Belvoir, VA/ Huntsville, AL	332.617	44.804	Oct 2019	50.054	Oct 2020	46.402	Oct 2021	-		46.402	Continuing	Continuing	Continuing
THAAD Program Support - Mission Support	MIPR	ATEC / SMDC / CCDC / MDA : WSMR, NM / Huntsville, AL	34.026	1.772	Dec 2019	2.782	Dec 2020	1.954	Dec 2021	-		1.954	Continuing	Continuing	Continuing
THAAD Program Support - Prime Contractor Support	SS/IDIQ	Lockheed Martin : Sunnyvale, CA / Huntsville, AL	0.600	0.000		0.000		0.000		-		0.000	0.000	0.600	0.000
THAAD Program Support - Prior year no longer funded in the FYDP	Various	Various : Various	136.579	0.000		0.000		0.000		-		0.000	0.000	136.579	0.000
		Subtotal	503.822	46.576		52.836		48.356		-		48.356	Continuing	Continuing	N/A

Remarks

N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		-		-		-		-	-	-	N/A

Remarks

N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		-		-		-		-	-	-	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	**Project (Number/Name)** MD07 / *THAAD*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,953.852	185.483		259.923		251.192		-		251.192	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	**Project (Number/Name)** MD07 / *THAAD*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
THAAD Software Build 4.0 - THAAD/Missile Segment Enhancement (MSE) Integration (JEON) Critical Design Review		▲																										
THAAD Software Build 5.0 - THAAD Updates to Maintain Mission Assurance System Requirement Review (SRR)							△																					
THAAD Software Build 4.0 - THAAD/Missile Segment Enhancement (MSE) Integration (JEON) FQT								△																				
THAAD Software Build 4.1 - Global Materiel Release Updates for Expanded THAAD Preliminary Design Review (PDR)								△																				
THAAD Software Build 4.1 - Global Materiel Release Updates for Expanded THAAD Critical Design Review (CDR)											△																	

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	**Project (Number/Name)** MD07 / *THAAD*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
THAAD Software Build 4.0 - THAAD/Missile Segment Enhancement (MSE) Integration (JEON) Critical Design Review	2	2020	2	2020
THAAD Software Build 5.0 - THAAD Updates to Maintain Mission Assurance System Requirement Review (SRR)	3	2021	3	2021
THAAD Software Build 4.0 - THAAD/Missile Segment Enhancement (MSE) Integration (JEON) FQT	4	2021	4	2021
THAAD Software Build 4.1 - Global Materiel Release Updates for Expanded THAAD Preliminary Design Review (PDR)	4	2021	4	2021
THAAD Software Build 4.1 - Global Materiel Release Updates for Expanded THAAD Critical Design Review (CDR)	3	2022	3	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	Project (Number/Name) MC07 / *Cyber Operations*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MC07: *Cyber Operations*	18.761	15.037	9.806	11.977	-	11.977	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Increase from FY 2021 to FY 2022 provides the improved cybersecurity requirements for software development efforts to align with Missile Defense Agency (MDA) and USD(R&E) priorities.
Development efforts involve more robust cybersecurity for both offense and defense to address the advanced threat.

A. Mission Description and Budget Item Justification

Cyber Operations sustain MDA Risk Management Framework (RMF) and Controls Validation Testing (CVT) activities; analysis of validation results, risk assessments; reviews of proposed Program Manager/Information Assurance Manager Plans of Action and Milestones for MDA THAAD mission systems; and supports THAAD certification to operate in the MDS.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Network / System Certification and Accreditation (C&A)	15.037	9.806	11.977
Articles:	-	-	-
Description: Funding in this project sustains MDA Risk Management Framework (RMF) and Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments, monitoring and tracking of cybersecurity mitigations, and all other activities necessary to comply with the Federal Information Security Management Act (FISMA). Recurring efforts include: - Conduct cybersecurity/information assurance engineering and architecture planning for THAAD information technology systems. - Develop and testing cybersecurity/information assurance control measures for MDS THAAD systems. - Develop THAAD RMF for DoD Information Technology Certification and accreditation packages. - Support CVT of THAAD mission, test, and training systems. - Develop Plan of Action and Milestones (POA&Ms) to resource and remediate information assurance deficiencies. - Conduct annual information assurance reviews on the THAAD enclaves to assess compliance in implementing and maintaining Information Assurance (IA) controls. - Perform Information Assurance Vulnerability Alert (IAVA) to mitigate potential system vulnerabilities. - Update THAAD software and hardware to ensure compliance with DoD Weapon System Information Assurance Programs. - Continue THAAD Weapon System software development efforts consistent with DoD cybersecurity requirements which were previously covered under THAAD Development, in order to correlate cyber software activities with realigned funding.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	**Project (Number/Name)** MC07 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -SEE ABOVE. ***FY 2022 Plans:*** -SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides the improved cybersecurity requirements for software development efforts to align with Agency and USD(R&E) priorities. Development efforts involve more robust cybersecurity for both offense and defense to address the advanced threat.			
Accomplishments/Planned Programs Subtotals	15.037	9.806	11.977

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208866C: MD07: *THAAD O&M*	86.425	89.903	86.828	-	86.828	-	-	-	-	-	-
• 0208866C: MD07: *THAAD Procurement*	407.203	578.335	251.543	-	251.543	-	-	-	-	-	-
• 0604876C: *Ballistic Missile Defense Terminal Defense Segment Test*	24.771	1.000	32.697	-	32.697	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The THAAD program awards Indefinite Delivery Indefinite Quantity (IDIQ) Task Orders on the Advanced Capability Development (ACD) contract for THAAD development. The ACD contract is comprised of over 40 separate task orders with varying contract types such as firm fixed price, fixed price incentive firm, cost plus incentive fee, and cost plus fixed fee. The discrete task orders allow management and tracking of development work.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	Project (Number/Name) MC07 / *Cyber Operations*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Network / System Certification and Accreditation (C&A) - CND/IA Advisory and Assistance Services	C/CPFF	Torch Technologies : Various MDA Locations	4.114	1.002	Oct 2019	0.761	Oct 2020	1.114	Oct 2021	-		1.114	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Security Engineering	SS/CPFF	LMSSC : Sunnyvale, CA/Huntsville, AL	14.647	14.035	Dec 2019	9.045	Dec 2020	10.863	Dec 2021	-		10.863	Continuing	Continuing	Continuing
		Subtotal	18.761	15.037		9.806		11.977		-		11.977	Continuing	Continuing	N/A

Remarks

N/A.

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	18.761	15.037		9.806		11.977		-		11.977	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	**Project (Number/Name)** MC07 / *Cyber Operations*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MC07 Completed Cyber Operations	✦	✦	✦	✦	✦																							
MC07 Planned Cyber Operations						✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	**Project (Number/Name)** MC07 / *Cyber Operations*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MC07 Completed Cyber Operations	1	2020	1	2021
MC07 Planned Cyber Operations	2	2021	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	Project (Number/Name) MD06 / *Patriot Advanced Capability-3 (PAC-3)*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD06: *Patriot Advanced Capability-3 (PAC-3)*	297.424	86.767	26.198	1.226	-	1.226	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2021 to FY 2022 reflects completion of Software Build 4.0 THAAD/MSE Integration Part 1 (JEON).

A. Mission Description and Budget Item Justification

PAC-3 is an operational, land-based weapon built upon the proven U.S. Army Phased Array Tracking Radar Intercept on Target (PATRIOT) air and missile defense infrastructure. The Army is responsible for production and further development of the PAC-3 System and Missile Segment Enhancements (MSE); MDA remains responsible for any MDS interoperability and integration efforts. The Army's Project Manager for Short and Intermediate Effectors for Layered Defense (PM SHIELD) will utilize MDA funds to further the integration of PATRIOT with the MDS.

This project includes PM SHIELD's portion of the JEON including:
1) PATRIOT launch on remote to utilize THAAD's capability to detect and track threat ballistic missiles at longer ranges and utilize MSE's full kinematic capability
2) THAAD/MSE Integration Part 1 that integrates MSE launchers and missiles into the THAAD weapon system enabling a more tightly integrated upper/lower tier defensive capability

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: General Support	1.156	1.198	1.226
Articles:	-	-	-
Description: MDA funds PATRIOT participation in MDS interoperability integration efforts. Activities support the day-to-day tasking that is leveraged upon PM SHIELD by MDA based on the Transfer and Transition Plan Annex L. ***FY 2021 Plans:*** -SEE ABOVE. ***FY 2022 Plans:*** -SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A.			
Title: JEON - PM SHIELD	85.611	25.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	**Project (Number/Name)** MD06 / *Patriot Advanced Capability-3 (PAC-3)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Articles:	-	-	-
Description: This accomplishment fully funds PM SHIELD's portion of the JEON including PATRIOT Launch on Remote and THAAD/MSE integration Part 1. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - Completes THAAD/MSE Integration Part 1 that integrates MSE launchers and missiles into the THAAD weapon system enabling a more tightly integrated upper/lower tier defensive capability. ***FY 2022 Plans:*** - No funding is requested for this effort in FY 2022. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects completion of Software Build 4.0 THAAD/MSE Integration Part 1 (JEON).			
Accomplishments/Planned Programs Subtotals	86.767	26.198	1.226

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208866C: *MD07: THAAD O&M*	86.425	89.903	86.828	-	86.828	-	-	-	-	-	-
• 0208866C: *MD07: THAAD Procurement*	407.203	578.335	251.543	-	251.543	-	-	-	-	-	-
• 0604876C: *Ballistic Missile Defense Terminal Defense Segment Test*	24.771	1.000	32.697	-	32.697	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The planned acquisition strategy for PATRIOT support is to provide Military Interdepartmental Purchase Requests (MIPR) to the U.S. Army PM SHIELD to further the integration of PATRIOT with the MDS.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	Project (Number/Name) MD06 / *Patriot Advanced Capability-3 (PAC-3)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JEON - PM SHIELD - JEON - PM SHIELD	MIPR	PM SHIELD : Huntsville, AL	287.200	85.611	Dec 2019	25.000	Dec 2020	0.000		-		0.000	0.000	397.811	0.000
		Subtotal	287.200	85.611		25.000		0.000		-		0.000	0.000	397.811	N/A

Remarks

N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
General Support - General Support	MIPR	PM SHIELD : Huntsville, AL	10.224	1.156	Nov 2019	1.198	Nov 2020	1.226	Nov 2021	-		1.226	Continuing	Continuing	Continuing
		Subtotal	10.224	1.156		1.198		1.226		-		1.226	Continuing	Continuing	N/A

Remarks

N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		-		-		-		-	-	-	N/A

Remarks

N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		-		-		-		-	-	-	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	Project (Number/Name) MD06 / *Patriot Advanced Capability-3 (PAC-3)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	297.424	86.767		26.198		1.226		-		1.226	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	**Project (Number/Name)** MD06 / *Patriot Advanced Capability-3 (PAC-3)*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD06 Completed Patriot Advanced Capability-3 (PAC-3) General Support	✦	✦	✦	✦	✦																							
MD06 Planned Patriot Advanced Capability-3 (PAC-3) General Support						✧	✧	✧	✧	✧	✧	✧																
MD06 JEON - PM SHIELD						△																						

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	**Project (Number/Name)** MD06 / *Patriot Advanced Capability-3 (PAC-3)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD06 Completed Patriot Advanced Capability-3 (PAC-3) General Support	1	2020	1	2021
MD06 Planned Patriot Advanced Capability-3 (PAC-3) General Support	2	2021	4	2022
MD06 JEON - PM SHIELD	2	2021	2	2021

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	Project (Number/Name) MD40 / *Program-Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program-Wide Support*	103.891	8.025	16.390	13.554	-	13.554	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	8.025	16.390	13.554
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the STEM program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; the FSRM program (formerly Real Property Maintenance) to keep the Department's			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	**Project (Number/Name)** MD40 / *Program-Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - See ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the PWS allocation on a pro-rata basis across multiple Agency PE's each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.			
Accomplishments/Planned Programs Subtotals	8.025	16.390	13.554

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	Project (Number/Name) MD40 / *Program-Wide Support*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Facilities and Maintenance	MIPR	Various : VA	3.500	1.473	Oct 2019	0.000		7.165	Oct 2021	-		7.165	Continuing	Continuing	Continuing
Program Wide Support - Agency Facilities and Maintenance SRM	MIPR	Various : Multi: AK, AL, CA, CO, HI, NY, VA	0.000	0.000		0.000		0.018	Nov 2021	-		0.018	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations Management	Various	Various : Multi: AL, CA, CO, VA	6.989	0.120	Jul 2020	0.000		0.000		-		0.000	0.000	7.109	0.000
Program Wide Support - Agency Operations and Support Civilian Salaries, Travel, Training	Various	Various : MDA Multi: AL, CO, CA, VA,	14.599	3.401	Oct 2019	0.000		0.700	Oct 2021	-		0.700	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support International and Materiel and Readiness	MIPR	Various : Multi: AL, VA, Aust, Japan	3.492	0.000		0.000		0.000		-		0.000	0.000	3.492	0.000
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AL, CO, VA	70.009	3.031	Dec 2019	16.390	Dec 2020	5.666	Oct 2021	-		5.666	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations, Sustainment and GPC	C/CPFF	Various : AK, AL, CA, HI, NY, VA	0.000	0.000		0.000		0.005	Nov 2021	-		0.005	Continuing	Continuing	Continuing
Program Wide Support - FFRDC/UARC	C/CPAF	Various : Multi: AL, VA	1.787	0.000		0.000		0.000		-		0.000	0.000	1.787	0.000
Program Wide Support - Prior year no longer funded in the FYDP	Various	Various : Various	3.515	0.000		0.000		0.000		-		0.000	0.000	3.515	0.000
		Subtotal	103.891	8.025		16.390		13.554		-		13.554	Continuing	Continuing	N/A

Remarks

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	Project (Number/Name) MD40 / *Program-Wide Support*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	103.891	8.025		16.390		13.554		-		13.554	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603881C / *Ballistic Missile Defense Terminal Defense Segment*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

THIS PAGE INTENTIONALLY LEFT BLANK

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0603882C *I Ballistic Missile Defense Midcourse Defense Segment*

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	6,168.582	1,275.414	1,219.261	745.144	-	745.144	-	-	-	-	-	-
MD08: *Ground Based Midcourse*	5,921.315	1,142.633	1,134.545	690.929	-	690.929	-	-	-	-	-	-
MC08: *Cyber Operations*	86.734	76.467	44.824	24.800	-	24.800	-	-	-	-	-	-
MD40: *Program-Wide Support*	160.533	56.314	39.892	29.415	-	29.415	-	-	-	-	-	-

Program MDAP/MAIS Code: 362

Note

The decrease from FY 2021 to FY 2022 reflects the completion of five boosters, Ground Systems 8 Software Build, Ground-Based Midcourse Defense (GMD) Communication Network (GCN) Modernization, and In-Flight Interceptor Communication System (IFICS) Data Terminal (IDT) Tech Refresh; and the required number of fielded Ground-Based Interceptors (GBIs) throughout the Future Years Defense Program (FYDP), as well as the manpower shifting focus from GBIs to the Next Generation Interceptors (NGIs).

A. Mission Description and Budget Item Justification

The GMD is an element of the Missile Defense System (MDS) that provides combatant commands (CCMDs) with a continuously available (24 hours a day, 7 days a week, 365 days a year) capability to defend the Homeland against limited Intercontinental Ballistic Missile (ICBM) attacks. The GMD capability consists of GBI, GMD Fire Control system (GFC), GCN, IDT, and Ground Launch Support Systems (LSS). Each GBI delivers a single kill vehicle to defeat threat warheads in space during the midcourse phase of the ballistic trajectory. The GFC consists of fire control nodes in Fort Greely, Alaska (FGA) and Missile Defense Integration and Operations Center (MDIOC) Colorado Springs, Colorado. IDTs are currently located in FGA; Vandenberg Air Force Base, California (VAFB); Eareckson Air Station, Alaska (EAS); and Fort Drum, New York. LSS are currently located in FGA and VAFB. The GMD capability leverages integration of MDS sensors across the globe. Development objectives for GMD include: improve homeland defensive capability against an evolving threat that is increasing both in number of missiles and complexity of threat payloads; execute flight testing; modernize the GMD weapon system to enhance capability and increase reliability; provide fire control and communications; reliability testing and upgrades to sustain the current fleet; develop GBI software enhancements and service life extensions that improve reliability, capability, and discrimination; improve GMD models and simulations (M&S); and participate with other MDS assets in system ground tests.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0603882C *I Ballistic Missile Defense Midcourse Defense Segment*

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	1,303.716	1,004.305	776.125	-	776.125
Current President's Budget	1,275.414	1,219.261	745.144	-	745.144
Total Adjustments	-28.302	214.956	-30.981	-	-30.981
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-33.044			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	250.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-26.830	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	-1.472	-2.000	-30.981	-	-30.981

Change Summary Explanation

Increase in FY 2021 provides Congressional add for GMD reliability/Service Life Extension Program (SLEP) and reflects Congressional reductions for inadequate justification and future contracts preparation.

Decrease in FY 2022 reflects manpower efficiencies and inflation adjustments and realignments for Next Generation Interceptor (NGI).

Decrease in FY 2022 also reflects a reduced quantity of GBI removals and emplacements for LSS upgrades, as well as the realignment of GBI software development in FY 2022 due to the accelerated delivery of EKV software 24.0 in FY 2020 utilizing the Risk Reduction Congressional Plus-Up funds in the Improved Homeland Defense Interceptors Program Element, 0604874C.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	Project (Number/Name) MD08 / *Ground Based Midcourse*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD08: *Ground Based Midcourse*	5,921.315	1,142.633	1,134.545	690.929	-	690.929	-	-	-	-	-	-
Quantity of RDT&E Articles	63	-	-	-	-	-	-	-	-	-		

Note

The decrease from FY 2021 to FY 2022 reflects the completion of the acquisition of five boosters (two integrated boost vehicles and 3 complete kits) and the required number of fielded GBI throughout the FYDP, the manpower shifting focus to the NGIs, as well as, completion of GS-8 Software Build, GCN Modernization, and development for the IDT Tech Refresh.

A. Mission Description and Budget Item Justification

GMD includes development and delivery of GMD Ground Systems, GBIs, Systems Engineering and Program Management. Development objectives for GMD include: improve homeland defensive capability against an evolving threat that is increasing both in number of missiles and complexity of threat payloads, execute Flight Tests to gather data and demonstrate MDS capability, modernize the GMD ground system to provide improved fire control and communications with reduced obsolescence risk for increased availability for the warfighter, develop GBI software enhancements that improves reliability and discrimination, improve GMD M&S, and participate with other MDS assets in system ground tests. GMD will continue the effort to develop and field improved standalone and integrated MDS discrimination capabilities, both of which will improve the System's ability to identify lethal reentry vehicles and non-lethal threat objects for enhanced interceptor performance.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Ground Based Interceptor	257.375	211.572	105.560
Articles:	-	-	-
Description: The GBI program develops improvements to enhance reliability, counter emerging threats, and improve system performance for fielded GBIs. The GBI reliability program conducts the analysis and testing necessary to characterize the reliability and service life of the GBI Fleet. The data generated from the reliability program allows the Program Office to manage the GBI fleet, develop fleet maintenance strategies, and extend interceptor service life. MDA engineering uses this data to develop battle simulations for the ground test program. The Warfighter uses this data to develop tactics, techniques, and procedures. The GBI program has multiple planned software builds to better utilize off-board sensor data providing improved on-board discrimination capabilities to select the most lethal object in the threat scene. Recurring work: -Conduct key Exo-atmospheric Kill Vehicle (EKV) engineering assessments to document current performance/capability and identify potential risk areas to assess and improve overall kill vehicle (KV) reliability for the Warfighter -Collect Reliability, Availability, Maintainability and Testability (RAM-T) data and analysis of performance metrics on the Operational System in order to continuously improve the system for the Warfighter			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Continue Probabilistic Risk Assessment (reliability model) development to assess the GBI design enabling improvements to overall GBI reliability for Warfighter defense of the homeland -Continue Stockpile Reliability Program (SRP) functional testing of naturally aged GBI subsystems and components removed from previously fielded GBIs during upgrade/modification to understand performance and aging characteristics in order to establish life limits, achieve GBI maintenance cost savings, and build Warfighter confidence in aging GBIs -Conduct rocket motor propellant studies to extend the service life of limited life items in order to achieve cost savings on GBI lifecycle maintenance and further build Warfighter confidence in aging GBIs -Develop software to improve system robustness and reliability -Sustain the capability to develop and test replacement components and to upgrade the GBI fleet -Continue to use the EKV Hardware-in-the-Loop 10V Chamber for operational analysis of emerging threats, discrimination improvements performance, pre-mission testing and post flight analysis and reconstruction in accordance with the Integrated Master Test Plan (IMTP) to reduce execution risks and gain confidence that capabilities performed as expected Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -Complete interceptor integration, emplacement and checkout to support Flight Test GMD Boost Vehicle Test (BVT)-03 which demonstrates the 2/3 stage selectable capability -Complete acquisition of five boosters to support flight testing and to ensure the number of fielded GBIs does not decrease through the FYDP -Initiate integration and fielding of two GBIs using two Capability Enhancement (CE)-IIs, Block 1 EKVs and two Configuration (C2) boosters. -Complete development and testing of EKV software 11.0 which provides improved salvo performance and incorporates additional feature data from MDS sensors to improve discrimination performance -Conduct EKV Hardware-in-the-Loop 10V Chamber testing with EKV 11.0 and EKV 23.2 to assess performance against emerging threats and discrimination improvements -Initiate preparation of a removed GBI for an intercept flight test in FY 2023. This preparation will include integration of a range termination and telemetry kit ***FY 2022 Plans:*** -Develop EKV software to provide additional mid-term discrimination and homeland threat space updates for the CE-II fleet -Maintain boost vehicle software -Begin integration of hardware for flight test GBI to support FTG-12			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Begin transition from Development and Sustainment Contract (DSC) to In-service GBI Fleet contracts to demonstrate and deploy new Homeland Defense Increment Capabilities to establish well-defined Capability-based baselines and an enduring Readiness baseline ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The decrease from FY 2021 to FY 2022 reflects the completion of the acquisition of five boosters, integration of two GBIs using spare components, and development of EKV 11.0 software.			
Title: Ground Systems & Fire Control	319.786	272.766	182.382
Articles:	-	-	-
Description: The GMD Ground Systems enable control and operation of the GMD Element as part of the MDS. Ground Systems consists of the GMD Fire Control system, GCN, IDT and Launch Site Components (LSC) (silos, silo interface vaults [SIVs]). These components collect and process sensor data, perform mission planning and fire control, command the launch of GBIs, communicate with interceptors in flight, and provide environmental support for GBIs during peacetime. Recurring Efforts include: -Continue development of the Fort Greely Communication Center to improve communication redundancy -Continue fielding GCN modernization efforts to support FGA Missile Field 4, improve Cybersecurity posture, and replace aging hardware and software that is no longer supportable -Continue development, testing and integration of FGA Missile Field 4 and new Launch Support System with GMD Ground Systems to increase Silo capacity and modernize Silo Interface Vault equipment in existing Silos -Continue development and testing of the Ground Systems 9 software build that provides additional discrimination improvements and implements MDS System Track. MDS System Track fuses data from multiple sensors and provides GMD with improved track accuracy and additional discrimination features Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -Develop the Phased Array IDT antenna to enable on demand communication with additional interceptors throughout flight with increased frequency of communication events. This will enable kill vehicles to provide additional target scene information to GMD Fire Control enabling enhanced situational awareness for the Warfighter and improved battle management. This upgrade addresses obsolescence with the current IDT by replacing aged equipment and processors -Field a replacement programmable modem and receiver/transmitter for the IDT to increase communications bandwidth and enable multiple waveforms to communicate with existing and future interceptors. This upgrade addresses obsolescence with the current IDT by replacing aged equipment			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Continue to develop the Fort Greely Communication Center to improve communication redundancy -Field GCN modernization efforts to support FGA Missile Field 4, improve Cybersecurity posture, and replace aging hardware and software that is no longer supportable -Continue development, testing and integration of FGA Missile Field 4 and new Launch Support System with GMD Ground Systems to increase Silo capacity and modernize Silo Interface Vault equipment in existing Silos ***FY 2022 Plans:*** - Complete fielding the programmable modem and receiver/transmitter for the IDT to increase communications bandwidth and enable multiple waveforms to communicate with existing and future interceptors. This upgrade addresses obsolescence with the current IDT by replacing aged equipment -Complete development and begin fielding of Ground Systems 8 software builds. Ground Systems 8 software incorporates 2/3 stage GBI capability, integrates Long Range Discrimination Radar (LRDR) with GMD fire control, and incorporates new discrimination data from Sea-based X-band Radar (SBX) -Continue development of the Phased Array IDT antenna to enable on demand communication with additional interceptors throughout flight with increased frequency of communication events. This will enable kill vehicles to provide additional target scene information to GMD Fire Control enabling enhanced situational awareness for the Warfighter and improved battle management. This upgrade addresses obsolescence with the current IDT by replacing aged equipment and processors -Initiate requirements development and engineering efforts for Ground Systems 10 software to incorporate code modernization, initial Phased Array IDT capabilities, initiation of development/security/operations (DevSecOps), mid-term Layered Homeland Defense upgrades, and early integration to support initial flight tests of Next Generation Interceptor - Implement robust cyber resiliency in GMD systems by developing system level requirements that flow to component level designs, allowing GMD systems to operate in a cyber-contested environment - Implements software and hardware fixes to address weaknesses found during testing - Develop and test an integrated Computer Network Defense system that improves the operator's ability to detect and respond to real-time cyber integration efforts ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The decrease from FY 2021 to FY 2022 reflects completion of the development of GS-8 Software Build to support fielding at labs and operational sites, completion of GCN Modernization development, completion of development for the IDT Tech Refresh, and ramp-down of Missile Field-4			
Title: Systems Engineering and Program Management	324.289	318.696	316.986
Articles:	-	-	-
Description: GMD Systems Engineering, GMD Product Engineering, and Program Management provides essential engineering and program management functions for the development, fielding, and sustainment of the GMD Weapon System (GWS).			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
GMD Systems Engineering delivers valued and collaborative technical leadership, capability, and products to field a verifiably effective GWS to defeat the strategic missile threat to the United States Homeland. GMD Systems Engineering provides key functions and products such as architecture engineering, performance requirements development and verification, interface requirements development and verification, testing and performance analysis, modeling and simulation development, integration, verification, and validation, including Digital and Hardware-in-the-Loop M&S improvements (such as common M&S framework development and environmental modeling) required to develop and conduct MDS-level high-fidelity simulations, digital engineering infrastructure, configuration management, software independent verification, validation, and software assessment, technical integration, and GMD Engineering Development and Early Integration Lab operations. GMD Systems Engineering manages the GMD Technical Baseline ensuring rigorous engineering processes and controls are in place to sustain Warfighter confidence through focus on reliability, readiness, and sustainment; improve engagement capability; and increase speed of delivery of new acquisitions to address the evolving threat. GMD Product Engineering delivers sound and integrated engineering and manufacturing processes and products thorough engineering controls, management, and verification; independent test, analysis, and assessment of failed and high risk events and engineering efforts; hardware and software readiness; and industrial and manufacturing readiness. GMD Product Engineering provides key functions and products, such as GWS design; risk, issues, and opportunities management; interface designs; and failure review boards. GMD Product Engineering manages the GMD Operational Baseline ensuring rigorous engineering processes and controls are in place for the configuration-controlled listing of approved GMD-level hardware and software is available for the Warfighters' use in their mission to defend the United States Homeland. GMD Technical Direction Agent (TDA) provides the technical expertise and program execution experience required to offer the Missile Defense Agency independent analysis, unbiased and objective weapon system level-oriented advice on technical issues and product development, and recommendations on technical issues and product development challenges faced in the GMD Program. Program Management provides for prime contractor management of all GMD development and sustainment activities to ensure technical content delivery in line with cost, schedule, and performance objectives. This effort includes program and business management, program administration, subcontract management, technical and testing oversight, verification of hardware and software development, quality/safety/mission assurance, integrated logistics support, and infrastructure to develop, test and sustain the GMD system and components. Systems Integration, Test and Readiness (SITR) is charged with being the government's technical partner for system level engineering, integration, test, and readiness responsibilities and day-to-day operation of the GWS alongside the USNORTHCOM			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
warfighters. While the Government maintains overall authority, the SITR prime contractor will assume the role of technical agent responsible for ensuring overall GMD integration including physical and logical integration of the GMD components, GMD system and MDA enterprise level integration, planning and execution of all necessary testing to verify and validate overall requirements compliance. Government Program Office defines requirements and manages the overall program; SITR provides the technical expertise and process ownership to integrate and execute the program. SITR organizes and runs the processes that provides the Government the oversight. SITR does not have authority to direct the GMD development efforts. Key responsibility for the SITR Prime Contractor is the overall performance of the integrated GMD weapon system including: 1) Execute GMD element-level critical engineering processes and activities for system integration and test to include current and future systems; 2) Demonstrate GMD Homeland Defense Capability through GMD Element and Missile Defense System (MDS) System-Level Flight, Ground, and Cybersecurity Developmental Testing (DT) and Operational Testing (OT); and 3) Perform GMD system operations to include weapon system operation, site operations, maintenance, test support, training, and upgrades. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -Execute Increment 6B.2 Preliminary Design Review (PDR) and Critical Design Review (CDR) incorporating new discrimination function and integration of space-based kill assessment -Update the GMD Architecture Model incorporating key content for GMD Increment 6C -Update the GMD performance and interface requirements supporting allocated capabilities in GMD Increments 6B.2, 6C, 7 and beyond; conduct performance analyses on those capabilities -Update the GMD verification approaches for GMD performance and interface requirements to support Increment 6B Critical Design Review -Conduct Quick Response Analyses for Real-World Events, Department of Defense Requests for Information/Analyses, and Warfighter Requests for Information/Analyses -Develop and update GMD M&S products supporting GMD performance analyses, MDS Flight Tests, and MDS Ground Test -Develop/deliver GMD models and supporting M&S components to meet system-level and enterprise M&S test infrastructure requirements -Expand the GMD M&S Laboratory hardware strings -Upgrade the M&S cybersecurity infrastructure -Develop/deliver GMD M&S verification and validation objective evidence products supporting accreditation decisions -Perform SW IV&V and Assurance to improve the quality of the software supporting Increments 6B.2, 6C and 7			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Develop discrimination improvements to increase GMD engagement capability and deliver the capacity to outpace emerging threats -Develop/deliver GWS laboratory hardware for HWIL integrated testing data supporting performance assessments, requirements verification, and fielding decisions -Establish a Government GWS HWIL laboratory ***FY 2022 Plans:*** Support the Warfighter with Increased Reliability and Readiness: - Integrate and Deliver Models and Simulations Supporting Ground Tests - Execute Ground Test Analysis and Cyber Test Analysis - Maintain GMD Engineering Development and Early Integration Lab Authorities to Operate Increase Engagement Capability and Capacity: - Execute GMD Increment 6B Critical Design Review - Execute GMD Performance Deep Dive Assessments to further analyze system design, engineering and integration details - Execute Ground Systems Software Independent Verification and Validation and Software Assurance - Expand Government GMD Engineering Development and Early Integration Lab Capabilities Address the Advanced Threat: - Expand the GMD Digital Engineering Integrated Digital Data Environment - Complete the acquisition process and initiate the System Engineering, Integration, Test, and Readiness (SITR) contract to facilitate the system engineering activities for the GMD Weapon System for MDS Increments 9 and 10 - Continue development of threat discrimination improvements to enhance GMD performance against existing and emerging threats ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Program Operations	61.183	58.576	46.476
Articles:	-	-	-
Description: Program Operations provides for government management of the GMD program. This effort provides: -Technical, business, acquisition, configuration management and integration activities to ensure the GMD program meets cost, schedule, and performance goals -Ensure program compliance with internal and external direction, policies, and regulations to deliver critical capability within a consistent and disciplined process			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Internal Agency program reviews to measure program progress against the six MDA approved baselines -Mission Assurance and Manufacturing Engineering Program to include Quality, Configuration Management, Manufacturing, Engineering, and Safety (QSMA) in all phases of the system life cycle, throughout the supply chain, and at all levels of assembly emphasizing high yield rates which minimize test and rework costs -Sustainment of core infrastructure and unified communications services to accomplish the GMD mission ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects reductions for program manpower efficiencies and realignment to support NGI development.			
Title: GMD Weapon System/GBI Service Life Extension Program (SLEP) ***Articles:*** ***Description:*** The GMD Weapon System / GBI Service Life Extension Program (SLEP)completes reliability upgrades for existing weapon system and GBI components, sustains repair capabilities, and performs other activities to sustain the existing GBI and GMD Weapon System capability. Recurring work: - Sustain equipment at production/repair facilities - Continue reliability upgrades on existing GBI fleet and weapon system components ***FY 2021 Plans:*** -Produce SLEP kits containing long lead materials for reliability upgrades on existing GBI fleet ***FY 2022 Plans:*** -SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 funding reflects FY 2021 Congressional Plus-Up (CPU) funds for GMD reliability/SLEP.	180.000 -	272.935 -	39.525 -
Accomplishments/Planned Programs Subtotals	1,142.633	1,134.545	690.929

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208866C: MD08: *Midcourse Defense O&M*	152.235	148.749	156.623	-	156.623	-	-	-	-	-	-
• 0208866C: MD08:: *GMD Procurement*	285.471	150.000	0.000	-	0.000	-	-	-	-	-	-
• 0604874C: *Improved Homeland Defense Interceptors*	514.062	860.384	926.125	-	926.125	-	-	-	-	-	-
• 0604887C: *Ballistic Missile Defense Midcourse Defense Segment Test*	96.711	67.071	61.424	-	61.424	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The GMD program will continue to follow testing, development, and evolutionary acquisition through incremental development. The Agency acquisition strategy ensures GMD components are upgraded to improve both All-Up System performance and All Up Round (AUR) performance in order to retain the proven GMD contribution to the integrated MDS. This acquisition approach reduces obsolescence risk, provides opportunities for incremental capability improvements, and allows decision makers to make informed trades between cost, schedule, and performance while exploring improved operational and technological capabilities.

GMD awarded a competitive DSC on December 30, 2011. This contract included development, fielding, test, systems engineering, integration, and configuration management; equipment manufacturing and upgrade; training, operations and sustainment of the GMD system and associated support facilities.

On January 31, 2018, the DSC Extension was awarded to the Boeing Company with a period of performance through 1QFY2024. The DSC Extension includes supporting test, engineering, software, and performance based logistics scope. The DSC structure breaks out major efforts into separate Contract Line Item Numbers with each having incentive fees under the Cost Plus Incentive Fee contract.

The current prime contractor is responsible for the entirety of the GMD scope. GMD's current DSC period of performance ends in December 2023 for general scope, with one contract line item remaining to allow the prime contractor to complete the delivery of MDS Increment 6c/7 in 2024. Boeing executes the DSC with four major subcontractors: Northrop Grumman Mission Systems, Northrop Grumman Innovation Solutions, Raytheon Missile Systems, Vigor, and many other minor subcontractors.

GMD Future Acquisition Strategy scope will satisfy future GWS requirements beyond DSC's support through MDS Increment 7, and will initiate and execute concurrently while the DSC scope is completing. This scope includes weapon systems engineering and integration; ground system hardware and software development; ground and flight tests; and readiness operations, sustainment, training, and exercises.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

The Agency issued four requests for information (RFI) to industry between September 2019 and August 2020. Market Research indicated a competitive environment exists for a portion of future GMD work. MDA hosted GM Industry Day as well as GM one-on-one sessions with interested contractors in January 2021. Acquisition documentation and Requests for Proposal are under development to support first Contract Award(s) for GMD Future Acquisition Strategy by 2QFY2022.

MDA reviewed all acquisition equities and determined that based on the existing competitive environment that portions of the future development, production, operations, and sustainment of the GMD should be competitively aligned to minimize program risks and to provide effective defense of the homeland.

GMD Future Acquisition Strategies include:
-MDA plans to competitively award a single System Engineering, Integration, Test, and Readiness (SITR) contract to provide along with the Technical Direction Agent (TDA) a synergistic approach in executing the element-level engineering, integration, test, and readiness of the GMD System.
-MDA plans to competitively award a single GWS contract to provide design, development, production, product level testing, sustainment planning, and deployment of new capabilities for the Weapon System.
-MDA plans to award sole source contracts to the GMD's original equipment manufacturers (OEMs) to perform service life extensions and maintain the existing fleet, execute repairs, and software development.

-Increments 9 and 10 will be executed with the SITR and GWS contracts. Both contracts are expected to be awarded 2QFY2022.

GM is also implementing a more robust Program Board structure allowing more Government insight and decisions into the technical baseline and has changed business processes for greater Government involvement in Program decisions. In addition, GM utilizes Government laboratory M&S and analysis capabilities to augment the current DSC efforts.

High-Level Acquisition Strategy Summaries:
GWS is charged with sustaining the current ground and communication element of the GWS, and with developing future ground and communication systems required for the introduction of NGI and other MDS requirements external to GMD. The GWS contract will develop software to interface with the addition of the NGI fleet, provide the warfighter capability to operate the GWS with a mixed fleet of currently fielded Exo-atmospheric Kill Vehicles (EKV) on C1 and C2 boosters and NGI, identify and develop solutions for messages between GWS and in-flight KVs, and update the legacy system to remain effective while NGI is under development. GWS is a new, competitive effort requiring a transition plan with DSC.

In-Service Fleet (ISF) is the acquisition approach for sustainment of the existing interceptor fleet beyond DSC. This effort is intended primarily to ensure fleet viability until replacement interceptors (NGI) are fielded. ISF is constrained to the legacy interceptor fleet and its component boosters and kill vehicles. This effort is necessary to develop and field solutions for legacy interceptor's service life extension, reliability and obsolescence requirements.

Systems Integration, Test and Readiness (SITR) is charged with being the government's technical partner for system level engineering, integration, test, and readiness responsibilities and day-to-day operation of the GWS alongside the USNORTHCOM warfighters. While the Government maintains overall authority, the SITR prime

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

contractor will assume the role of technical agent responsible for ensuring overall GMD integration including physical and logical integration of the GMD components, GMD system and MDA enterprise level integration, planning and execution of all necessary testing to verify and validate overall requirements compliance.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ground Based Interceptor - Additional Boosters	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	148.978	70.896	Nov 2019	48.977	Nov 2020	0.000		-		0.000	0.000	268.851	0.000
Ground Based Interceptor - All Up Round Development	C/CPIF	Boeing : AL/AK/AZ/ CA/CO/TX/VA	16.965	0.000		0.000		0.000		-		0.000	0.000	16.965	0.000
Ground Based Interceptor - Booster Development	C/CPIF	Boeing : AL/AK/AZ CA/CO/TX/VA	125.000	0.000		0.000		0.000		-		0.000	0.000	125.000	0.000
Ground Based Interceptor - Configuration 2 CBAU Booster Development	C/CPIF	Boeing : AL/AK/AZ CA/CO/TX/VA	54.550	0.000		0.000		0.000		-		0.000	0.000	54.550	0.000
Ground Based Interceptor - EKV Spares	C/CPIF	Boeing : AL/AK/AZ/ CA/CO/TX/VA	6.811	0.000		0.000		0.000		-		0.000	0.000	6.811	0.000
Ground Based Interceptor - Flight Rotations for MDS Testing	C/CPIF	Boeing : AL/AK/AZ/ CA/CO/TX/VA	73.950	0.000		0.000		0.000		-		0.000	0.000	73.950	0.000
Ground Based Interceptor - GBI Integration for Flight Test	C/CPIF	Boeing : AL/AK/AZ/ CA/UT	0.000	11.395	Dec 2019	0.000		10.342	Jan 2022	-		10.342	Continuing	Continuing	Continuing
Ground Based Interceptor - GBI Parts Testing & Reverse Flow	C/CPIF	Boeing : AL/AK/AZ/ CA/CO/TX/VA	0.000	4.267	Nov 2019	0.000		0.000		-		0.000	0.000	4.267	0.000
Ground Based Interceptor - GBI Prime Product Support	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	381.732	77.616	Nov 2019	51.677	Nov 2020	0.000		-		0.000	0.000	511.025	0.000
Ground Based Interceptor - GBI Relocations & Emplacements	C/CPIF	Boeing : AL/AK/AZ/ CA/CO/TX/VA	0.000	0.000		17.239	Nov 2020	0.000		-		0.000	0.000	17.239	0.000
Ground Based Interceptor - GBI Repairs & Upgrades	C/CPIF	Boeing : AL/AK/CA/ CO/TX/VA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	0.000
Ground Based Interceptor - Government Reliability Program	MIPR	CCDC / Redstone Arsenal, AL : NSWC Crane, IN	29.360	3.963	Nov 2019	4.668	Nov 2020	0.000		-		0.000	0.000	37.991	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ground Based Interceptor - Ground Based Interceptors #48-58 (CE-II)	C/CPIF	Boeing : AL/AK/AZ/CA/CO/TX/VA	716.580	0.000		0.000		0.000		-		0.000	0.000	716.580	0.000
Ground Based Interceptor - Interceptor Manufacturing Support	MIPR	NASA MSFC& CCDC, HSV, AL Draper Laboratory, MA; : Vanguard, HSV, AL	19.821	15.332	Dec 2019	7.022	Nov 2020	0.000		-		0.000	0.000	42.175	0.000
Ground Based Interceptor - Kill Vehicle Space Chamber Testing	MIPR	AEDC : Tullahoma, TN	0.000	6.467	Nov 2019	8.220	Nov 2020	0.000		-		0.000	0.000	14.687	0.000
Ground Based Interceptor - Logistics and Safety Support	C/CPIF	Venturi, Network Management Resources Inc, TBD : AL/AK/CA/CO/NY	0.000	2.008	Dec 2019	3.469	Jan 2021	2.954	Jan 2022	-		2.954	Continuing	Continuing	Continuing
Ground Based Interceptor - Operational Spares	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	28.962	0.000		0.000		0.000		-		0.000	0.000	28.962	0.000
Ground Based Interceptor - Prime Interceptor Manufacturing & Lab Support	C/CPIF	Boeing : AL/AK/AZ/CA/CO/TX/VA	69.227	0.000		5.445	Nov 2020	0.000		-		0.000	0.000	74.672	0.000
Ground Based Interceptor - Prime Reliability Program	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	49.206	41.194	Nov 2019	15.280	Nov 2020	0.000		-		0.000	0.000	105.680	0.000
Ground Based Interceptor - Software Maintenance & Updates	C/CPIF	Boeing AL/AK/AZ : CA/UT/TBD	97.874	24.237	Nov 2019	49.575	Nov 2020	23.958	Nov 2021	-		23.958	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Ft. Greely Comm Center	C/CPIF	Boeing : AL/AK/AZ/CA/UT	0.000	0.000		0.000		20.692	Nov 2021	-		20.692	Continuing	Continuing	Continuing
Ground Systems & Fire Control - GS-10 Software & Hardware Development	C/CPIF	TBD : TBD	0.000	0.000		8.400	Jan 2021	61.699	Jan 2022	-		61.699	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ground Systems & Fire Control - GS-11 Software & Hardware Development	C/CPFF	TBD : TBD	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Ground Systems & Fire Control - GS-12 Software & Hardware Development	C/CPIF	TBD : TBD	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Ground Systems & Fire Control - GS-8 Software & Hardware Development	C/CPIF	Boeing : AL/AK/CA/CO/VA	0.000	51.437	Dec 2019	86.596	Jan 2021	27.617	Jan 2022	-		27.617	Continuing	Continuing	Continuing
Ground Systems & Fire Control - GS-9 Software & Hardware Development	C/CPIF	Boeing/TBD : AL/AK/CA/CO/VA/TBD	0.000	57.415	Dec 2019	99.884	Jan 2021	46.264	Jan 2022	-		46.264	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Government Fort Drum IDT	MIPR	MDA/AL : /VA/NY	0.576	0.000		0.000		0.000		-		0.000	0.000	0.576	0.000
Ground Systems & Fire Control - Government Missile Field 4 (20 Silos)	MIPR	MDA : AL/VA	11.782	0.000		5.708	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Government Software Development	MIPR	CCDC : Redstone Arsenal, AL	10.962	4.346	Nov 2019	2.106	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Ground Systems & Fire Control - MF-1: two silos to ensure the number of fielded GBIs does not decrease through the FYDP	C/CPIF	Boeing : AL/AK/AZ/CA/CO/VA	14.958	0.000		0.000		0.000		-		0.000	0.000	14.958	0.000
Ground Systems & Fire Control - Phased Array IDTs	TBD	Competitive Contract Award : TBD	0.000	0.216	Nov 2019	0.000		16.934	Nov 2021	-		16.934	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Prime CLE Re-Architecture	C/CPIF	Boeing AL/AK/AZ : CA/CO/VA	46.609	0.000		0.000		0.000		-		0.000	0.000	46.609	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ground Systems & Fire Control - Prime Communications Infrastructure	C/CPIF	Boeing AL/AK/AZ : CA/CO/VA	9.968	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Prime Fort Drum IDT	C/CPIF	Boeing AL : CO/NY/VA	10.063	0.000		0.000		0.000		-		0.000	0.000	10.063	0.000
Ground Systems & Fire Control - Prime Ground Systems Software Development	C/CPIF	Boeing AL/AK/AZ : CA/CO/VA	567.065	53.946	Nov 2019	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Prime MF-1 Repair and Refurbishment	C/CPIF	Boeing AL/AK/AZ : CA/CO/VA	38.925	0.000		0.000		0.000		-		0.000	0.000	38.925	0.000
Ground Systems & Fire Control - Prime Missile Field 4 (20 Silos)	C/CPIF	Boeing/TBD : AL/AK/CA/CO/VA/TBD	100.095	21.493	Nov 2019	0.334	Nov 2020	2.319	Nov 2021	-		2.319	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Prime On Demand Communications	C/CPFF	Boeing : AL/AK/AZ/CA/CO/TX/VA	5.820	27.945	Nov 2019	1.862	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Prime Technology Refresh	C/CPIF	Boeing/TBD : AL/AK/CA/CO/VA/TBD	421.530	102.988	Nov 2019	67.876	Nov 2020	1.523	Nov 2021	-		1.523	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Prime Modeling and Simulation	C/CPIF	Boeing : AL	0.000	0.000		0.000		2.034	Nov 2021	-		2.034	Continuing	Continuing	Continuing
GMD Weapon System/GBI Service Life Extension Program (SLEP) - GMD Weapon System/GBI Service Life Extension Program (SLEP)	C/CPIF	Boeing/TBD : AL/AK/AZ/CA/UT/TBD	0.000	180.000	Sep 2020	272.935	Nov 2020	39.525	Nov 2021	-		39.525	Continuing	Continuing	Continuing
		Subtotal	3,057.369	757.161		757.273		255.861		-		255.861	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

To comply with the Financial Management Regulation, updated the R-3 cost categories and moved product support efforts into the correct cost category.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ground Based Interceptor - GBI Prime Product Support	C/CPIF	Boeing/TBD : AL/AZ/UT/CA/AK/TBD	0.000	0.000		0.000		38.852	Nov 2021	-		38.852	Continuing	Continuing	Continuing
Ground Based Interceptor - GBI Relocations & Emplacements	C/CPIF	Boeing : AL/AK	0.000	0.000		0.000		1.691	Nov 2021	-		1.691	Continuing	Continuing	Continuing
Ground Based Interceptor - Government Reliability Program	C/CPIF	Northrop Grumman Syst, Jacobs Tech Inc, Network Mgmt Resources Inc : AL/CO/IN	0.000	0.000		0.000		5.823	Nov 2021	-		5.823	Continuing	Continuing	Continuing
Ground Based Interceptor - Kill Vehicle Space Chamber Testing	C/CPIF	Boeing/TBD : AL/TN/OH/TBD	0.000	0.000		0.000		12.206	Nov 2021	-		12.206	Continuing	Continuing	Continuing
Ground Based Interceptor - Logistics & Safety Support	C/CPIF	TBD : AL/CA/AK/CO	0.000	0.000		0.000		3.723	Nov 2021	-		3.723	Continuing	Continuing	Continuing
Ground Based Interceptor - Prime Reliability Program	C/CPIF	Boeing/TBD : AL/TBD	0.000	0.000		0.000		6.011	Nov 2021	-		6.011	Continuing	Continuing	Continuing
Ground Systems & Fire Control - GS-11 Software and Hardware Development	C/CPIF	TBD : AL, TBD	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Ground Systems & Fire Control - GS-8 Software and Hardware Development	C/CPIF	TBD : TBD	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ground Systems & Fire Control - Government Missile Field 4 (20 Silos)	C/CPIF	TBD : AK, TBD	0.000	0.000		0.000		4.190	Nov 2021	-		4.190	Continuing	Continuing	Continuing
Ground Systems & Fire Control - Government Software Development	C/CPIF	TBD : AK, CO, MD, TBD	0.000	0.000		0.000		1.144	Nov 2021	-		1.144	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Government Discrimination Improvements	MIPR	FFRDC/UARC/ John Hopkins Univ Applied Physics Lab, Parsons Govt Serv, TBD : AL/ TBD	19.408	11.379	Nov 2019	3.266	Nov 2020	0.290	Nov 2021	-		0.290	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Government EKV HWIL Tests in Space Chamber	MIPR	AEDC : Tullahoma, TN	39.996	0.000		0.000		0.000		-		0.000	0.000	39.996	0.000
Systems Engineering and Program Management - Government Modeling and Simulation	MIPR	SED & Morrow Labs, TBD : Redstone Arsenal/AL, TBD	131.856	32.705	Nov 2019	25.057	Nov 2020	26.312	Nov 2021	-		26.312	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Government Systems Engineering & Integration	MIPR	Jacobs Tech Inc, Parsons Govt Serv, Torch Tech Inc, TBD : AL	177.428	65.182	Nov 2019	65.295	Nov 2020	61.364	Nov 2021	-		61.364	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Information Management & Technology Ops	C/CPAF	Northrop Grumman/ Jacobs Engineering : AL, AK, CA, CO, HI, NM, VA	50.790	12.157	Nov 2019	12.565	Nov 2020	12.261	Nov 2021	-		12.261	Continuing	Continuing	Continuing
Systems Engineering and Program Management - M&S Element Improvements	C/CPIF	Boeing : AL/CA/CO/ VA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	0.000
Systems Engineering and Program Management - M&S Industry Support	C/CPAF	Northrop Grumman : Al, VA	2.539	0.000		0.000		0.000		-		0.000	0.000	2.539	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	Project (Number/Name) MD08 / *Ground Based Midcourse*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering and Program Management - Prime Design, Readiness, Analysis and Reporting	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	23.672	0.000		0.000		0.000		-		0.000	0.000	23.672	0.000
Systems Engineering and Program Management - Prime Discrimination Improvements	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	124.072	3.400	Dec 2019	5.359	Nov 2020	0.000		-		0.000	0.000	132.831	0.000
Systems Engineering and Program Management - Prime EKV HWIL Tests in Space Chamber	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	70.656	0.000		0.000		0.000		-		0.000	0.000	70.656	0.000
Systems Engineering and Program Management - Prime Modeling and Simulation	C/CPIF	Boeing : AL, AZ	215.657	17.521	Nov 2019	19.016	Nov 2020	22.220	Nov 2021	-		22.220	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Prime Program Management	C/CPIF	Boeing : AL/AK/AZ/ CA/CO/UT	376.052	72.639	Nov 2019	51.284	Nov 2020	51.050	Nov 2021	-		51.050	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Prime System Engineering and Integration	C/CPIF	Boeing/TBD : AL/AZ/ TBD	427.643	50.202	Nov 2019	73.336	Nov 2020	73.605	Nov 2021	-		73.605	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Systems Engineering & Analysis	MIPR	Various, TBD : AL/ VA/TBD	30.260	32.695	Dec 2019	36.644	Nov 2020	6.345	Nov 2021	-		6.345	Continuing	Continuing	Continuing
Systems Engineering and Program Management - Systems Engineering & Analysis - CSS Support	C/CPFF	TEAMS : AL	26.823	0.000		0.000		6.396	Nov 2021	-		6.396	Continuing	Continuing	Continuing
Systems Engineering and Program Management -	MIPR	Various : AL/VA	14.298	0.000		0.000		3.848	Nov 2021	-		3.848	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering & Analysis – FFRDC / UARC															
Systems Engineering and Program Management - Systems Engineering & Analysis – Industry Support	C/CPIF	Boeing : AL	31.014	0.000		0.000		4.370	Nov 2021	-		4.370	0.000	35.384	0.000
Systems Engineering and Program Management - Systems Engineering and Program Management - Discrimination Engineering & Analysis	C/CPIF	Boeing : AL/CA/CO/VA	38.168	0.000		0.000		8.500	Nov 2021	-		8.500	0.000	46.668	0.000
Systems Engineering and Program Management - Systems Engineering and Program Management M&S Support	Allot	MDA : AL/VA	54.467	0.000		0.000		6.979	Nov 2021	-		6.979	0.000	61.446	0.000
Systems Engineering and Program Management - Technical Direction Agent	MIPR	John Hopkins Univ Applied Physics Lab LLC, Various : AL/CA/MD/NM/UT/MA/VA/GA/PA/CO	72.995	26.409	Nov 2019	26.874	Nov 2020	31.412	Nov 2021	-		31.412	Continuing	Continuing	Continuing
Program Operations - Contract Support Services	C/CPFF	Various : AL/AK/CA/CO/VA	478.713	20.851	Nov 2019	19.543	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Program Operations - FFRDC Support	MIPR	MIT/LL : AL/VA/CO	53.348	2.215	Nov 2019	0.000		0.708	Nov 2021	-		0.708	Continuing	Continuing	Continuing
Program Operations - Government Civilian Salaries	MIPR	MDA : AL/VA	324.816	32.812	Oct 2019	33.135	Oct 2020	23.082	Oct 2021	-		23.082	Continuing	Continuing	Continuing
Program Operations - Information Technology Services	MIPR	Jacobs Technology Inc. : AL/CO	8.606	2.799	Nov 2019	3.377	Oct 2020	2.550	Oct 2021	-		2.550	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Operations - Other Government Agencies	MIPR	Various : AL/VA/FL/CO	57.594	0.920	Nov 2019	1.055	Nov 2020	0.807	Nov 2021	-		0.807	Continuing	Continuing	Continuing
Program Operations - Safety and Quality	MIPR	MDA : AL/AK/CA/VA	0.583	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Operations - Travel	MIPR	MDA : AL/VA	12.492	1.586	Oct 2019	1.466	Oct 2020	0.771	Oct 2021	-		0.771	Continuing	Continuing	Continuing
		Subtotal	2,863.946	385.472		377.272		416.510		-		416.510	Continuing	Continuing	N/A

Remarks

To comply with the Financial Management Regulation, updated the R-3 cost categories and moved product support efforts into the correct cost category.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ground Systems & Fire Control - GS-11 Software and Hardware Development	C/CPIF	TBD : TBD	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Operations - Contract Support Services	C/CPIF	AI Solutions, APT Research Inc, BCF Solutions, Booz Allen Hamilton, Macaulay-Brown, Parsons Government Services, Strategic Alliance Business Group, Venturi, Veterans Tech, Yorktown Systems Group : AL/CO/AK	0.000	0.000		0.000		18.558	Nov 2021	-		18.558	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		18.558		-		18.558	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	Project (Number/Name) MD08 / *Ground Based Midcourse*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks N/A															

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	5,921.315	1,142.633		1,134.545		690.929		-		690.929	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

$18.558 million for Program Operations - Contract Support Services moved from Product Support to Management Services to correct the cost category.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
Communications Infrastructure	✦	✦	✦	✦																								
Ground Based Interceptors Rotation and Upgrades	✦	✦	✦	✦																								
Technology Refresh	✦	✦	✦	✦																								
BVT-03 Interceptor Integration, Checkout and Emplacement	✦	✦	✦	✦	✦																							
EKV SW 11.0 Development and Testing	✧	✧	✧	✧	✧	✧	✧																					
IDT Modernization	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Acquisition of Five C2 Boost Vehicles	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Ground Systems Software 8 Development	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Missile Field 4/1 Modernization/Expansion	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
GCN Modernization	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Ground Systems Software 9 Development	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Phased Array IDT	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Stockpile Reliability Program Testing	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Fort Greely Communications Center							✧	✧	✧	✧	✧	✧																
Ground System Software 10 Development							✧	✧	✧	✧	✧	✧																
Upgrade, Integrate and Emplace Intercept Flight Test								✧	✧	✧	✧	✧																
EKV SW 12.0 Development										✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD08 / *Ground Based Midcourse*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Communications Infrastructure	1	2020	4	2020
Ground Based Interceptors Rotation and Upgrades	1	2020	4	2020
Technology Refresh	1	2020	4	2020
BVT-03 Interceptor Integration, Checkout and Emplacement	1	2020	1	2021
EKV SW 11.0 Development and Testing	1	2020	3	2021
IDT Modernization	1	2020	4	2022
Acquisition of Five C2 Boost Vehicles	1	2020	4	2022
Ground Systems Software 8 Development	1	2020	4	2022
Missile Field 4/1 Modernization/Expansion	1	2020	4	2022
GCN Modernization	1	2020	4	2022
Ground Systems Software 9 Development	1	2020	4	2022
Phased Array IDT	1	2020	4	2022
Stockpile Reliability Program Testing	1	2020	4	2022
Fort Greely Communications Center	3	2021	4	2022
Ground System Software 10 Development	3	2021	4	2022
Upgrade, Integrate and Emplace Intercept Flight Test	4	2021	4	2022
EKV SW 12.0 Development	2	2022	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	Project (Number/Name) MC08 / *Cyber Operations*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MC08: *Cyber Operations*	86.734	76.467	44.824	24.800	-	24.800	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2021 to FY 2022 reflects the movement of Ground Systems Cyber hardware/software budget from MC08 to Ground Systems and Fire Control in MD08; the movement of Cyber Security and Cyber Resiliency - Facility-Related Control Systems budget from MC08 to MC30; and the completion of the development phase of the Computer Network Defense System. The decrease also reflects manpower efficiencies.

A. Mission Description and Budget Item Justification

The GMD Cyber Operations provide cybersecurity and cyber resiliency to maintain and operate all mission and mission support systems.

GMD systems must maintain Network and System Certification and Accreditation for operation on all GMD networks and nodes. Cybersecurity and Cyber Resiliency efforts harden the GMD system against a cyber-attack and reduces system vulnerabilities. The GMD strategy implements cybersecurity and cyber resiliency systems throughout the lifecycle to flow requirements to the Ground Based Interceptor and GMD Ground Systems to influence system development.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Network / System Certification and Accreditation (C&A)	7.957	8.492	6.577
Articles:	-	-	-
Description: GMD Systems maintain a defensive cyber posture through analysis of system software and hardware. By conducting annual cybersecurity reviews, all GMD systems are evaluated to ensure the systems are authorized per the Risk Management Framework (RMF) to assess compliance in implementing and maintaining cybersecurity controls. Develops GMD DoD RMF Assessment and Authorization packages, necessary to ensure all GMD networks and nodes maintain authority to operate. Recurring efforts include: -Implement the GMD Cybersecurity Risk Process across all systems to execute risk-based decisions on cybersecurity controls -Assess, implement, document, and validate up to 512 cybersecurity control families (1935 security protections and control enhancements) for 25 representative systems comprising 250,000 computing and logic bearing components to support the GMD Development, Test, Training, and Operational systems -Ensure compliance with security mandates to maintain continued authorization to operate -Ensure the cyber workforce is trained and qualified			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MC08 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Support modification of Installation Support Agreements for assigned real property to ensure Facility-Related Control Systems, supporting MDA facilities, are cyber-secure per DoDI 8510.01 ***FY 2021 Plans:*** -SEE ABOVE ***FY 2022 Plans:*** -SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The decrease from FY 2021 to FY 2022 reflects manpower efficiencies.			
Title: Cyber Security and Cyber Resiliency	68.510	36.332	18.223
Articles:	-	-	-
Description: Cybersecurity and Cyber Resiliency efforts harden the GMD system against a cyber-attack and reduces system vulnerabilities. The GMD strategy implements cybersecurity and cyber resiliency systems throughout the lifecycle to flow requirements to the Ground Based Interceptor and GMD Ground Systems to influence system development. Early cyber testing is completed to identify vulnerabilities and fixes early in the design process. Recurring Accomplishments: -Implement robust cyber resiliency in the GMD weapon systems by developing system level requirements that flow to component level designs, allowing the GMD system to operate in a cyber-contested environment -Support testing on developmental systems in a virtualized environment by integrating cyber test events allowing execution of specific cyber threat vectors on developmental software in an effort to identify capability flaws that will be assessed through the cyber risk process -Tests Cooperative Vulnerability and Penetration Assessment (CVPA) to discover unknown vulnerabilities and determine effectiveness of mitigations from development level cyber testing -Tests Support Adversarial Assessment penetration to determine effectiveness of cyber-attacks in an operational environment along with the effectiveness of the operational and technical mitigations implemented from developmental cyber testing -Implements software and hardware fixes to address weaknesses found during testing -Develop intermediate cybersecurity processes and procedures that provide operators, maintainers, and Warfighter specific steps to recognize and react to cyber-attacks, thus advancing the operational cyber resiliency through the defensive cyber operations capability			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MC08 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Develop and execute quarterly cybersecurity training scenarios allowing fire control operators and network defenders to train in a cyber-contested environment while in a kinetic engagement scenario -Provide training opportunities for Fire Control Operators and Cyber Incident Responders to test Tactics Techniques and Procedures to improve resiliency to a cyber-attack Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -Implement robust cyber resiliency in the GMD systems by developing system level requirements that flow to component level designs, allowing the GMD system to operate in a cyber-contested environment -Support testing on developmental systems in a virtualized environment by integrating cyber test events allowing execution of specific cyber threat vectors on developmental software in an effort to identify capability flaws that will be assessed through the cyber risk process -Tests CVPA to discover unknown vulnerabilities and determine effectiveness of mitigations from development level cyber testing -Tests Support Adversarial Assessment penetration to determine effectiveness of cyber-attacks in an operational environment along with the effectiveness of the operational and technical mitigations implemented from developmental cyber testing -Implements software and hardware fixes to address weaknesses found during testing -Develop intermediate cybersecurity processes and procedures that provide operators, maintainers, and Warfighter specific steps to recognize and react to cyber-attacks, thus advancing the operational cyber resiliency through the defensive cyber operations capability -Develop and test a new Computer Network Defense system that improves the operators ability to detect and respond to real-time cyber events -Develop and execute quarterly cybersecurity training scenarios allowing fire control operators and network defenders to train in a cyber-contested environment while in a kinetic engagement scenario -Provide training opportunities for Fire Control Operators and Cyber Incident Responders to test Tactics Techniques and Procedures to improve resiliency to a cyber-attack ***FY 2022 Plans:*** - Test a new Computer Network Defense system that improves the operators ability to detect and respond to real-time cyber events - Conduct Penetration Assessment on Fort Greely AK Power Plant systems to assess attack vectors and implement a Cyber Resilient design ***FY 2021 to FY 2022 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MC08 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Decrease from FY 2021 to FY 2022 reflects the movement of Ground Systems (GS) Cyber hardware/software budget from MC08 to Ground Systems and Fire Control in MD08 to align with the Financial Management Regulation (FMR) definition of weapons system cyber activities; and the completion of the development phase of the Computer Network Defense System. In addition, the decrease from FY 2021 to FY 2022 reflects a transfer to 0603890C BMD Enabling Programs in MC30: Cyber Operations into the Facility-Related Control Systems (FRCS) accomplishment. FRCS was realigned to the BMD Enabling Program to better align with all of the Missile Defense Agency facilities that will be assessed and supported.			
Accomplishments/Planned Programs Subtotals	76.467	44.824	24.800

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208866C: MD08: *Midcourse Defense O&M*	152.235	148.749	156.623	-	156.623	-	-	-	-	-	-
• 0208866C: MD08: *GMD Procurement*	285.471	150.000	0.000	-	0.000	-	-	-	-	-	-
• 0604874C: *Improved Homeland Defense Interceptors*	514.062	860.384	926.125	-	926.125	-	-	-	-	-	-
• 0604887C: *Ballistic Missile Defense Midcourse Defense Segment Test*	96.711	67.071	61.424	-	61.424	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The DSC with the Boeing Company as lead is used to design, test, implement and field technical solutions throughout the GMD system's architecture to ensure that sufficient cyber protections exist. The Technical, Engineering, Advisory, and Management Support (TEAMS) contract which includes Booz Allen Hamilton, Decisive Analytics, and Parsons, along with FFRDC MITRE personnel, is used to ensure Network and System Certification and Accreditation requirements are met.

The Integrated Research and Development for Enterprise Solutions (IRES) contract with Jacobs Engineering Group as lead is used to provide cyber related equipment, licenses and support

GMD awarded the competitive DSC on December 30, 2011 to the Boeing Company. This contract included development, fielding, test, systems engineering, integration, and configuration management; equipment manufacturing and upgrade; training, operations and sustainment of the GMD system and associated support facilities.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MC08 / *Cyber Operations*

On January 31, 2018, the DSC Extension was awarded to the Boeing Company with a period of performance through 1Q FY2024. The DSC Extension includes supporting test, engineering, software, and performance based logistics scope. The DSC structure breaks out major efforts into separate Contract Line Item Numbers with each having incentive fees under the Cost Plus Incentive Fee contract.

The current prime contractor is responsible for the entirety of the GMD scope. GMD's current DSC period of performance ends in December 2023 for general scope.

The GMD Future Acquisition Strategy scope will satisfy future GMD Weapon System requirements beyond DSC's MDS, and will initiate and execute concurrently while the DSC scope is completing. This scope includes systems engineering; ground system hardware and software; weapon system integration; ground and flight tests; and operations and sustainment.

The Agency issued four requests for information to industry between September 2019 and August 2020. Market Research indicated a competitive environment exists for a portion of future GMD work. MDA hosted GM Industry Day as well as GM one-on-one sessions with interested contractors in January 2021. Acquisition documentation and Requests for Proposal are under development to support first Contract Award(s) for GMD Future Acquisition Strategy by 2QFY 2022.

MDA reviewed all acquisition equities and determined that based on the existing competitive environment that portions of the future development, production, operations, and sustainment of the GMD should be competitively aligned to minimize program risks and to provide effective defense of the homeland.
GM is also implementing a more robust Program Board structure allowing more Government insight and decisions into the technical baseline and has changed business processes for greater Government involvement in Program decisions.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MC08 / *Cyber Operations*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Network / System Certification and Accreditation (C&A) - Network / System Certification and Accreditation (C&A) - Civilian Salaries	MIPR	MDA : AL/CA/CO	4.738	1.000	Nov 2019	1.329	Nov 2020	1.086	Nov 2021	-		1.086	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Network / System Certification and Accreditation (C&A) - Contract Support Services	C/CPFF	Booz Allen Hamilton, AL, Decisive Analytics, AL : Torch Technologies, AL Parsons, AL	23.057	6.957	Nov 2019	7.163	Nov 2020	0.000		-		0.000	0.000	37.177	0.000
Cyber Security and Cyber Resiliency - Cyber Security and Cyber Resiliency - Cybersecurity	C/CPAF	Jacobs, AL, CO : MITRE, AL	18.977	1.949	Nov 2019	2.079	Nov 2020	1.344	Nov 2021	-		1.344	Continuing	Continuing	Continuing
Cyber Security and Cyber Resiliency - Cyber Security and Cyber Resiliency - Facility-Related Control Systems Contract Method	C/CPFF	Booz Allen Hamilton : AL, VA	0.000	0.890	Nov 2019	0.893	Nov 2020	0.000		-		0.000	0.000	1.783	0.000
Cyber Security and Cyber Resiliency - Cyber Security and Cyber Resiliency - GMD Cybersecurity Program	C/CPAF	Boeing : AL/CO	25.190	41.863	Nov 2019	18.747	Nov 2020	16.879	Nov 2021	-		16.879	Continuing	Continuing	Continuing
Cyber Security and Cyber Resiliency - Cyber Security and Cyber Resiliency - Ground Systems Software Cybersecurity	C/CPIF	Boeing AL/AK/AZ : CA/CO/VA	14.772	23.808	Nov 2019	14.613	Nov 2020	0.000		-		0.000	0.000	53.193	0.000
		Subtotal	86.734	76.467		44.824		19.309		-		19.309	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	Project (Number/Name) MC08 / *Cyber Operations*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

$5.204 million for Network/System Certification and Accreditation - Contract Support Services moved from Product Support to Management Services to correct the cost category.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Network / System Certification and Accreditation (C&A) - Contract Support Services	C/CPIF	TEAMS - Parsons, Booz-Allen, Decisive Analytics : AL, CO, AK	0.000	0.000		0.000		5.491	Nov 2021	-		5.491	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		5.491		-		5.491	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	86.734	76.467		44.824		24.800		-		24.800	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.
$5.204 million for Network/System Certification and Accreditation - Contract Support Services moved from Product Support to Management Services to correct the cost category.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MC08 / *Cyber Operations*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
GMD Cybersecurity Mitigation Monitoring and Tracking	✦	✦	✦	✦																								
GMD Cybersecurity Program Policy / Risk Management	✦	✦	✦	✦																								
GMD Information Assurance Certification and Accreditation (C&A) Package Preparation/Submission	✦	✦	✦	✦																								
GMD Transition to Cybersecurity Risk Management Framework (CRMF)	✦	✦	✦	✦																								
BMDS Cybersecurity Policy Development	✦	✦	✦	✦																								
Network and System Certification and Accreditation	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Cybersecurity and Cyber Resiliency	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Cooperative Vulnerability Penetration Assessment (CVPA)	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Adversarial Assessment (AA)	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Computer Network Defense (CND)	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MC08 / *Cyber Operations*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
GMD Cybersecurity Mitigation Monitoring and Tracking	1	2020	4	2020
GMD Cybersecurity Program Policy / Risk Management	1	2020	4	2020
GMD Information Assurance Certification and Accreditation (C&A) Package Preparation/ Submission	1	2020	4	2020
GMD Transition to Cybersecurity Risk Management Framework (CRMF)	1	2020	4	2020
BMDS Cybersecurity Policy Development	1	2020	4	2020
Network and System Certification and Accreditation	1	2020	4	2022
Cybersecurity and Cyber Resiliency	1	2020	4	2022
Cooperative Vulnerability Penetration Assessment (CVPA)	1	2020	4	2022
Adversarial Assessment (AA)	1	2020	4	2022
Computer Network Defense (CND)	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	Project (Number/Name) MD40 / *Program-Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program-Wide Support*	160.533	56.314	39.892	29.415	-	29.415	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	56.314	39.892	29.415
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the STEM program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; the FSRM program (formerly Real Property Maintenance) to keep the Department's			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD40 / *Program-Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the PWS allocation on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.			
Accomplishments/Planned Programs Subtotals	56.314	39.892	29.415

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Facilities and Maintenance	MIPR	Various : Multi: AK, AL, CA, VA	6.920	0.000		0.000		0.000		-		0.000	0.000	6.920	0.000
Program Wide Support - Agency Facilities and Maintenance SRM	MIPR	Various : Multi: AK, AL, CA, HI, NY, VA	0.000	0.000		2.652	Jan 2021	0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations Management	C/CPAF	Various : Multi: AL, CA, CO, VA	17.224	0.698	Jul 2020	0.000		0.000		-		0.000	0.000	17.922	0.000
Program Wide Support - Agency Operations and Support Civilian Salaries, Travel, Training	Various	MDA : Multi: AK, AL, CA, CO, VA	78.339	32.086	Oct 2019	29.919	Oct 2020	29.415	Oct 2021	-		29.415	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Other Agency Services (MIPR)	MIPR	Various : Multi: AK, AL, CO, CA, HI, VA	26.298	0.000		0.319	Oct 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AK, AL,CA, CO, HI, VA	7.660	23.530	Nov 2019	6.202	Jul 2021	0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations, Sustainment and GPC	C/FFP	Various : Multi: AK, AL, CA, HI, NY, VA	0.000	0.000		0.800	Dec 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Prior year no longer funded in the FYDP	Various	Various : Various	24.092	0.000		0.000		0.000		-		0.000	0.000	24.092	0.000
		Subtotal	160.533	56.314		39.892		29.415		-		29.415	Continuing	Continuing	N/A

Remarks

Support is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	Project (Number/Name) MD40 / *Program-Wide Support*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	160.533	56.314		39.892		29.415		-		29.415	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Significant Event Complete ▲ | Significant Event Planned △ | Milestone Decision Complete ★ | Milestone Decision Planned ☆ | Element Test Complete ◆ | Element Test Planned ◇ | System Level Test Complete ● | System Level Test Planned ○ | Complete Activity ✦ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603882C / *Ballistic Missile Defense Midcourse Defense Segment*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 0603884C / *Ballistic Missile Defense Sensors*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	1,964.058	348.356	265.803	224.750	-	224.750	-	-	-	-	-	-
MD11: *BMDS Radars*	1,838.091	308.276	253.045	197.816	-	197.816	-	-	-	-	-	-
MC11: *Cyber Operations*	15.048	28.296	1.558	17.203	-	17.203	-	-	-	-	-	-
MD40: *Program-Wide Support*	110.919	11.784	11.200	9.731	-	9.731	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

Decrease from FY 2021 to FY 2022 reflects a ramp-down from an initial phase of X-Band radar Electronic Protection and Objective Debris Mitigation efforts, reductions for Efficiencies and Process Reforms, delay of L-200 threat mitigation, and manpower efficiencies.

A. Mission Description and Budget Item Justification

The Missile Defense System (MDS) network of layered Sensors provides essential situational awareness and fire control data for the command and control of MDS weapon systems, such as Ground-Based Midcourse Defense (GMD), Aegis Ballistic Missile Defense (BMD), and Terminal High Altitude Area Defense (THAAD). The suite of remote ground-based sensors provides early warning, midcourse, and terminal missile defense threat data. This data enables layered detection and tracking of missile targets, providing fire-control quality position, velocity, and discrimination data through GMD Fire Control (GFC), or Command and Control, Battle Management and Communications (C2BMC).

Overlapping coverage of geographically diverse sensors provides improved threat track data, reduces the impact of the loss of any one sensor, and reduces the potential impact of countermeasures. The extended coverage and accuracy provided by a network of layered sensors increases the defensive footprint and reduces the number of target engagements required, thereby conserving interceptor inventory and maintaining a high probability of successful engagement. Networked forward-based sensors enable C2BMC to pair the best sensor coverage with the best available weapon system to provide the most effective defense against missile threats.

This program element includes MDS threat discrimination improvements, which will enhance MDS effectiveness against the evolving adversary threat. The result will be a MDS architecture more capable of discriminating and destroying reentry vehicles with a higher degree of confidence, improving Warfighter shot doctrine, and more efficiently using interceptor inventory. MDS threat discrimination improvements are funded from the Enabling (0603890C), Midcourse (0603882C), BMD Sensors (0603884C), C2BMC (0603896C), and Aegis BMD (0603892C) PEs.

The BMD Sensors Program contributes to regional and homeland missile defense through the development, delivery, and deployment/redeployment of Army Navy/ Transportable Radar Surveillance and Control (AN/TPY-2) radars for operations or tests. AN/TPY-2 radars can be configured to operate as either a THAAD Fire Unit Radar (terminal mode) or Forward-Based Radar. These radars are transportable and add flexibility to respond to geographical changes in threats. Radars provide early warning tracking and discrimination data through all phases of missile flight. Through the MDS C2BMC and coalition data links, the AN/TPY-2 provides fire control data

to enable remote Standard Missile (SM)-3 engagements by Aegis BMD, and to cue deployed THAAD and U.S. and partner PATRIOT (Phased Array Tracking Radar to Intercept on Target) batteries.

The MDS sensor network includes: the Cobra Dane Radar at Eareckson Air Station, AK, the Upgraded Early Warning Radars (UEWRs) at Beale Air Force Base, CA; Fylingdales Royal Air Force, United Kingdom; and Thule Air Base, Greenland, for defense of the homeland. The Clear Ultra High Frequency Early Warning Radar (EWR), at Clear Air Force Station, AK, and the Cape Cod EWR, at Cape Cod Air Force Station, MA, are also being upgraded to include missile defense functionality against long-range threats in addition to their existing Missile Warning and Space Domain Awareness missions. Upgrade activities began in CY 2012 and are now projected to complete in early CY 2022 due to current UEWR operational configuration emergency maintenance required by United States Space Force (USSF) and COVID-19 challenges throughout CY 2020 and early CY 2021 that hampered radar site access for operational testing. The addition of the Clear UEWR and Cape Cod UEWRs to the MDS sensor architecture improves MDS sensor coverage and provides new engagement options against long-range missile threats from Northeast Asia and Southwest Asia respectively.

This program element also supports the planning and deployment of persistent radars.

Cyber Operations sustain the Risk Management Framework (RMF) and Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments, reviews of Plans of Action and Milestones (POA&Ms), and alignment and integration to the Tier 2 Cybersecurity Service Provider (CSSP) for the Sensors mission system.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	352.288	281.957	576.699	-	576.699
Current President's Budget	348.356	265.803	224.750	-	224.750
Total Adjustments	-3.932	-16.154	-351.949	-	-351.949
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-16.154			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-6.403	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	2.471	0.000	-351.949	-	-351.949

Change Summary Explanation

Decrease in FY 2021 reflects Congressional reduction for MD11 Modeling and Simulation development unjustified growth.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0603884C *I Ballistic Missile Defense Sensors*

Decrease in FY 2022 predominately reflects the realignment of Layered Homeland Defense funds to proper MDA program elements to implement refined program architecture.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / *Ballistic Missile Defense Sensors*	Project (Number/Name) MD11 / *BMDS Radars*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD11: *BMDS Radars*	1,838.091	308.276	253.045	197.816	-	197.816	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2021 to FY 2022 reflects a decrease of X-Band radar Electronic Protection and Objective Debris Mitigation efforts, reductions for Efficiencies and Process Reforms, delay of L-200 threat mitigation, and manpower efficiencies.

A. Mission Description and Budget Item Justification

The Missile Defense System (MDS) Radars project includes development of future AN/TPY-2, Cobra Dane, Long Range Discrimination Radar (LRDR), Sea Based X-Band (SBX), Sensors Layered Homeland Defense Radars, and Upgraded Early Warning Radars (UEWR) capabilities through system engineering; software development; and testing support.

Modeling and Simulation (M&S) efforts include enhanced sensor models, development of Radio Frequency scene generators, integration of digital simulations into the MDS M&S architecture, and Verification, Validation, and Accreditation of radar models. Joint Emerging Operational Needs Statement (JEONS) provides rapid deployment of software upgrades to optimize performance against increasing threats and improve regional integration. This project also funds participation and support for MDS element ground and flight test campaigns and Warfighter games and exercises.

This project provides development of discrimination advanced algorithms for MDS radars to counter evolving threats. The discrimination improvement effort will develop and field integrated element capabilities to improve MDS ability to identify lethal and non-lethal objects. Sensors will continue development of discrimination improvement mid-term design and test support for MDS radars and far term trade analysis and planning.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Basic Development Program	28.742	26.031	22.314
Articles:	-	-	-
Description: The Basic Development Program includes development and testing of software maintenance updates to address software trouble reports identified on fielded software versions and flight/ground test events. Software improvement efforts also include optimization of increased processing capabilities. The Basic Development Program also provides analysis of software performance during flight and ground testing to support Materiel Release for software deliveries. The Materiel Release Closure Plan for the AN/TPY-2 ensures the Reliability, Availability, and Maintainability (RAM) Program promotes reliability growth in the suite of AN/TPY-2 radars via product improvements.			
Specific and/or unique accomplishments to each FY are as follows:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MD11 / *BMDS Radars*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
FY 2021 Plans: - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects realignment to higher Agency priorities.			
Title: BMDS Radars Modeling & Simulation (M&S)	37.730	41.125	48.130
Articles:	-	-	-
Description: Missile Defense System (MDS) Radars M&S efforts include enhanced sensor models, development and maintenance of Radio Frequency (RF) scene generators, integration of digital simulations into the MDS, M&S architecture, and Verification, Validation, and Certification (VV&C) of radar models, including high fidelity models used for performance assessment. This effort includes support for technical and performance assessments using Open Systems Architecture Sensor Models (OSM), Open Systems Architecture Signal Injectors (OSI) and other models/tools, as well as development and sustainment of Digital and Hardware in the Loop (HWIL) representations of various simulations and models to include the tactical versions of AN/TPY-2, LRDR, SBX, UEWR, and CD. This effort funds the development of End-to-end Digital Integrated System-level Simulation (EDISS) and Ground Test Integrated System-level Simulation (GTISS) improvements to the MDA Ground Test Architecture. MDS Radars M&S efforts also fund the development and validation of Multi-band Electronic Attack Digital Injection Capability (MEDIC). This effort includes support for tactical requirements verification, including development and VV&C of models for testing electronic protection and objective debris mitigation algorithms. This project also supports war games, Warfighter exercises and training, and execution of element-level ground test campaigns, as well as the development of M&S frameworks and truth models required to anchor M&S. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** Digital M&S Priorities: - Conduct core modeling of real-world radar capabilities to keep pace with the evolving MDS - Continue efforts to meet EDISS v1 requirements, including software development, In-Progress Reviews, EDISS M&S Integration, Test, and Verification, Increment Acceptance Reviews, prioritizing LRDR and AN/TPY-2 modeling - Support preparation for Continuous Digital Assessments - Software Development of EDISS v2 including In-Progress Reviews - Continue systems engineering for EDISS v2, including System Requirements Review and System Functional Review			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MD11 / *BMDS Radars*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Initiate systems engineering for EDISS v3 - Initiate validation of high fidelity digital model for LRDR Ground Test M&S priorities: - Complete GTISS Phase 1 requirements development - Complete GTISS Phase 1 software development - Complete GTISS Phase 1 M&S Integration, Test, and Verification - Continue Engineering and Development of GTISS Phase 2 - Continue GTISS Phase 2 software development, including in-progress technical reviews - Initiate Integration and Test GTISS Phase 2 M&S - Initiate GTISS Phase 3 requirements analysis and functional analysis, develop system design - Initiate validation of high fidelity models for AN/TPY-2			
FY 2022 Plans: Digital M&S Priorities: - Continue core modeling of real-world radar capabilities to keep pace with the evolving MDS, continuing LRDR and AN/TPY-2 modeling, along with increasing modeling efforts on MDA standalone radars - Conduct supporting Continuous Digital Assessments - Continue integration, test, and analysis of EDISS v1 capabilities - Continue software development of EDISS v2 - Continue integration and testing for EDISS v2 - Initiate software development for EDISS v3 - Initiate EDISS v4 system requirements analysis - Initiate development of additional capabilities in high fidelity digital models for AN/TPY-2 and SBX - Continue validation of high fidelity digital model for LRDR Ground Test M&S Priorities: - Continue Phase 1 of GTISS improvements to the MDA Ground Test Architecture - Complete Engineering and Development of GTISS Phase 2 - Continue Integration and Test GTISS Phase 2 M&S - Complete GTISS Phase 3 Functional Analysis and System Design - Initiate GTISS Phase 3 Integration, Test, and Verification - Initiate development of additional capabilities in high fidelity ground test models			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MD11 / *BMDS Radars*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Continue validation of high fidelity models for AN/TPY-2 ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides for the development of additional Increment 6C/7 capabilities in Digital and Ground Test M&S supporting MDS-wide assessment for LRDR, AN/TPY-2, SBX, UEWR and CD radars and provides for an all-digital data production venue that supports performance assessment.			
Title: Capability Development Program	103.640	135.434	82.531
Articles:	-	-	-
Description: The Capability Development Program provides engineering support to enable compliance with BMD System Specification threat capabilities and addresses advanced threats. This task includes the redesign of select components to address obsolescence and improve reliability of the system. This task continues electronic protection and objective debris mitigation development efforts to reduce or eliminate the effect of corporate clutter and electronic attack on sensors. It develops, designs, and tests sensor mid-term discrimination improvements for X-Band radars, to include SBX threat discrimination improvements. This effort funds participation in far-term discrimination improvement threat model specifications and develops discrimination and countermeasure mitigation capability development. Additional software development activities include support to PATRIOT launch on THAAD capability, X86 performance optimization to enhance processing speed, improvements to cybersecurity posture, additional developmental of sensor electronic protection for AN/TPY-2 and LRDR, and developmental information system enhancements. This effort includes threat updates and verification, core standards system engineering, and required updates to models, simulation, and performance assessment. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - Initiate development of sensor mid-term discrimination improvements for X-Band radars, to include SBX threat discrimination improvements - Initiate development of sensor electronic protection for SBX - Initiate additional development of sensor electronic protection for AN/TPY-2 and LRDR and objective debris mitigation development efforts to reduce or eliminate the effect of corporate clutter and electronic attack on sensors - Continue expanded active sensor bias and full sensor bias reporting - Continue threat updates and verification, core standards system engineering, required updates to models and simulation, and performance assessments ***FY 2022 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MD11 / *BMDS Radars*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Continue development of sensor mid-term threat discrimination improvements for X-Band radars, to include SBX threat discrimination improvements - Continue development of sensor Electronic Protection and Objective Debris Mitigation development efforts to mitigate electronic attack and to reduce the effect of clutter on sensors - Initiate development of a domestic secure server solution to meet the AN/TPY-2 cybersecurity and performance requirements ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects a decrease in X-Band radar Electronic and Protection and Objective Debris Mitigation efforts, reductions for Efficiencies and Process Reforms, and delay in L-200 threat mitigation.			
Title: Sensors Directorate Operations	50.092	49.566	43.140
Articles:	-	-	-
Description: Program Operations provides strategic planning, program integration, contracting, acquisition, engineering, financial management, internal reviews and audits, and program assessments for the Sensors Program Office. Recurring activities include: - Provide technical and business management support activities to provide critical program status and decision quality data - Ensure Sensors program compliance with internal and external direction, policies, and regulations to deliver critical capability within a consistent and disciplined process - Conduct internal program reviews to measure program progress against the six Missile Defense Agency approved baselines - Continue a Mission Assurance and Manufacturing Engineering Program to include Quality, Configuration Management, Manufacturing, Engineering, and Safety in all phases of the system life cycle, throughout the supply chain, and at all levels of assembly emphasizing high yield rates which minimize test and rework costs - Provide Quality Safety and Mission Assurance (QSMA) operations to ensure compliance with Agency requirements for design, test, manufacturing, quality, safety and reliability to ensure high quality products are delivered to the Warfighter Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MD11 / *BMDS Radars*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Decrease from FY 2021 to FY 2022 reflect manpower efficiencies.			
Title: Upgrade Clear Early Warning Radar	3.172	0.889	1.701
Articles:	-	-	-
Description: Upgrade of Clear Early Warning Radar and Cape Cod Early Warning Radar includes adaptation of hardware and software to UEWR infrastructure, support to MDS communications and architecture work and installation at site. This project also includes preparation and removal of legacy equipment at each UEWR site. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -Complete operations and sustainment activities post operational acceptance to include interim contractor logistics support at Clear Air Force Station (AFS) ***FY 2022 Plans:*** -Initiate Automatic Data Processing Equipment (ADPE) Rehost strings for ISTC 1 and ISTC 2 required for CD to continue participation in ground tests ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides for ADPE Rehost strings for ISTC 1 and ISTC 2 required for CD to continue participation in ground tests.			
Title: Joint Emerging Operational Need (JEON)	15.900	0.000	0.000
Articles:	-	-	-
Description: Rapid deployment of software upgrades to optimize performance against increasing threats and improve regional integration. Phase 1 provides enhanced discrimination, increases search plan optimization, and updates Position, Navigation, and Timing and Regional Mission Data. Phase 2 improves debris mitigation to increase raid performance against threats, improves debris tracks on radar resources, and provides search plan upgrades that increase search acquisition and support remote launcher capabilities. Phase 3 provides additional increased search plan capabilities, implementation of the DoD Regional Clock, remote launcher upgrades to integrate AN/TPY-2 with PATRIOT and THAAD systems, and improves proficiencies against advanced threats in complex environments. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MD11 / *BMDS Radars*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
N/A ***FY 2022 Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: High Altitude Electromagnetic Pulse (HEMP) Hardening	69.000	0.000	0.000
Articles:	-	-	-
Description: This effort develops, designs, and tests HEMP upgrade capabilities for Army Navy/Transportable Radar Surveillance and Control (AN/TPY-2) Forward Based Mode (FBM) radar sites. ***FY 2021 Plans:*** N/A ***FY 2022 Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	308.276	253.045	197.816

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208866C MD11: *MDS Procurement*	10.046	243.270	2.738	-	2.738	-	-	-	-	-	-
• 0208866C MD11: *MDS Radars Program, Operation and Maintenance*	232.671	255.708	190.553	-	190.553	-	-	-	-	-	-
• 0603882C: *Ballistic Missile Defense Midcourse Defense Segment*	1,275.414	1,219.261	745.144	-	745.144	-	-	-	-	-	-
• 0603890C: *BMD Enabling Programs*	630.196	616.455	595.301	-	595.301	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MD11 / *BMDS Radars*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603896C: *Ballistic Missile Defense Command and Control, Battle Management & Communication*	550.513	645.741	603.448	-	603.448	-	-	-	-	-	-
• 0603898C: *Ballistic Missile Defense Joint Warfighter Support*	51.095	49.560	50.594	-	50.594	-	-	-	-	-	-
• 0603904C: *Missile Defense Integration and Operations Center (MDIOC)*	54.783	55.356	52.403	-	52.403	-	-	-	-	-	-
• 0603907C: *Sea Based X-Band Radar (SBX)*	137.604	118.318	147.241	-	147.241	-	-	-	-	-	-
• 0603914C: *Ballistic Missile Defense Test*	398.939	365.208	362.906	-	362.906	-	-	-	-	-	-
• 0604181C: *Hypersonic Defense*	386.528	272.632	247.931	-	247.931	-	-	-	-	-	-
• 0604672C: *Homeland Defense Radar-Hawaii*	181.569	133.000	0.000	-	0.000	-	-	-	-	-	-
• 0604673C: *Pacific Discriminating Radar*	2.921	0.000	0.000	-	0.000	-	-	-	-	-	-
• 0604873C: *Long Range Discrimination Radar (LRDR)*	131.135	138.317	133.335	-	133.335	-	-	-	-	-	-
• 0604879C: *Ballistic Missile Defense Sensor Test*	96.082	64.245	77.428	-	77.428	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The Radar Development Contract (RDC) awarded on Nov 1, 2017 supports the Sensors Directorate's X-Band Radars (XBR). Missile Defense System (MDS) capability and performance requirements, which underpin continuing XBR development requirements include, but are not limited to, the Army/Navy Transportable Radar Surveillance and Control (AN/TPY-2) radar and the Sea-Based X-Band (SBX) radar. These requirements stem directly from formal Warfighter requirements as developed in the United States Strategic Command (USSTRATCOM)-led Warfighter Involvement Process (see USSTRATCOM Special Instruction (SI) 538-3, Missile Defense Warfighter Involvement Process, June 25, 2008). Achievable requirements documented in the Prioritized Capabilities List (PCL) and Modification and Fielding Requirements List (MFRL) are documented in MDA's Achievable Capabilities List (ACL) and translated via the MDS architecture and system specifications into flow-down requirements, characteristics, and capability needs for individual MDS program specifications, and ultimately are approved through the systems engineering and

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MD11 / *BMDS Radars*

baseline change management process for MDS programs to execute. The RDC supports the XBRs for product improvement, including developmental upgrades of software and development of hardware and software to meet enhanced capabilities and risk reduction measures; warfighter support, including wargames and exercise support; engineering services, including engineering support for delivered and accepted radars to facilitate maintenance efforts which may include, but are not limited to, hardware obsolescence studies, hardware redesign, technology insertion and refurbishment; MDS test subject matter expert (SME) support; modeling and simulation SME support; and cybersecurity. These support activities are for all AN/TPY-2 radars, in the Forward Based Mode (FBM) and Terminal Mode (TM), and the SBX Radar to include the Weather Air Search Radar (WxASR) located on the SBX platform.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MD11 / *BMDS Radars*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Basic Development Program - Material Release Get Well Plan - AMCOM	MIPR	AMCOM : AL	0.283	0.285	Nov 2019	0.290	Nov 2020	0.133	Nov 2021	-		0.133	Continuing	Continuing	Continuing
Basic Development Program - Basic Development - SBX	SS/CPAF	Raytheon : MA	0.000	2.000	Nov 2019	2.000	Nov 2020	1.500	Nov 2021	-		1.500	Continuing	Continuing	Continuing
Basic Development Program - Information Assurance AN/TPY-2	SS/CPAF	Raytheon : MA	26.537	4.230	Nov 2019	3.131	Nov 2020	0.000		-		0.000	0.000	33.898	0.000
Basic Development Program - Information Assurance SBX	SS/CPAF	Raytheon : MA	1.303	0.000		0.000		0.000		-		0.000	0.000	1.303	0.000
Basic Development Program - Material Release Get Well Plan - ATEC	MIPR	ATEC : AL	0.715	0.820	Nov 2019	0.697	Nov 2020	0.000		-		0.000	0.000	2.232	0.000
Basic Development Program - Material Release Get Well Plan - CCDC	SS/CPAF	CCDC AVMC : AL	17.649	1.250	Dec 2019	1.125	Nov 2020	0.000		-		0.000	0.000	20.024	0.000
Basic Development Program - Sys Integration & Tech Assessments	MIPR	CCDC AVMC : AL	26.283	3.132	Nov 2019	2.100	Nov 2020	0.000		-		0.000	0.000	31.515	0.000
Basic Development Program - X-Band Software Enhancements/ Development	SS/CPAF	Raytheon : AL	127.914	17.025	Feb 2020	16.688	Nov 2020	20.681	Nov 2021	-		20.681	Continuing	Continuing	Continuing
BMDS Radars Modeling & Simulation (M&S) - M&S Development	SS/CPFF	Raytheon : AL,MA, CO	158.157	20.540	Jan 2020	25.717	Jan 2021	33.741	Jan 2022	-		33.741	Continuing	Continuing	Continuing
BMDS Radars Modeling & Simulation (M&S) - M&S Development - Boeing	C/CPAF	Boeing : AL	0.000	0.248	Nov 2019	0.000		0.000		-		0.000	0.000	0.248	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MD11 / *BMDS Radars*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
BMDS Radars Modeling & Simulation (M&S) - M&S Development - Decibel	C/CPAF	Decibel : AL	0.000	2.000	Jan 2020	0.000		0.000		-		0.000	0.000	2.000	0.000
BMDS Radars Modeling & Simulation (M&S) - M&S Development - Northrop Grumman	C/CPAF	Northrop Grumman : AL	0.000	1.219	Mar 2020	0.000		0.000		-		0.000	0.000	1.219	0.000
BMDS Radars Modeling & Simulation (M&S) - M&S Development-FFRDC/ UARC	Various	JHU, MITRE : MD, AL	0.000	1.171	Oct 2019	0.000		0.000		-		0.000	0.000	1.171	0.000
BMDS Radars Modeling & Simulation (M&S) - M&S Development-LM	SS/CPIF	Lockheed Martin : NJ	0.000	6.043	Nov 2019	2.600	Nov 2020	3.144	Nov 2021	-		3.144	Continuing	Continuing	Continuing
BMDS Radars Modeling & Simulation (M&S) - VV&A of Models	MIPR	CCDC AVMC : AL	59.223	3.969	Dec 2019	9.520	Dec 2020	7.898	Dec 2021	-		7.898	Continuing	Continuing	Continuing
BMDS Radars Modeling & Simulation (M&S) - VV&A of Models - GTRI	FFRDC	GTRI : GA	0.000	0.126	Oct 2019	0.780	Oct 2020	0.796	Oct 2021	-		0.796	Continuing	Continuing	Continuing
BMDS Radars Modeling & Simulation (M&S) - Warfighter Exercises	SS/CPFF	Raytheon : MA	14.372	2.414	Mar 2020	2.508	Feb 2021	2.551	Feb 2022	-		2.551	Continuing	Continuing	Continuing
Capability Development Program - Electronic Protection - GTRI	SS/CPFF	GTRI : GA	0.521	0.000		0.000		0.000		-		0.000	0.000	0.521	0.000
Capability Development Program - Electronic Protection - PRIME	C/CPAF	Raytheon : MA	18.315	0.000		29.354	Nov 2020	17.270	Nov 2021	-		17.270	Continuing	Continuing	Continuing
Capability Development Program - Enhanced Discrimination - CCDC	MIPR	CCDC AVMC : AL	8.214	4.586	Nov 2019	6.200	Nov 2020	0.500	Nov 2021	-		0.500	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MD11 / *BMDS Radars*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Capability Development Program - Enhanced Discrimination - MITRE	FFRDC	MITRE : AL	3.187	0.743	Nov 2019	0.000		0.000		-		0.000	0.000	3.930	0.000
Capability Development Program - AN/TPY-2 Capability Development - CCDC	MIPR	CCDC AVMC : AL	10.390	10.408	Nov 2019	8.850	Nov 2020	4.977	Nov 2021	-		4.977	Continuing	Continuing	Continuing
Capability Development Program - AN/TPY-2 Capability Development - GTRI	SS/CPFF	GTRI : GA	0.000	1.084	Nov 2019	0.000		0.000		-		0.000	0.000	1.084	0.000
Capability Development Program - AN/TPY-2 Capability Development - JHU	FFRDC	John Hopkins University : MD	4.408	0.933	Oct 2019	0.000		0.000		-		0.000	0.000	5.341	0.000
Capability Development Program - AN/TPY-2 Capability Development - NSWC	MIPR	Naval Surface Warfare Center : VA	0.000	0.094	Nov 2019	0.000		0.000		-		0.000	0.000	0.094	0.000
Capability Development Program - AN/TPY-2 Capability Development - PRIME	SS/CPAF	Raytheon : MA	205.642	27.306	Nov 2019	21.279	Nov 2020	25.536	Nov 2021	-		25.536	Continuing	Continuing	Continuing
Capability Development Program - Communication Development	MIPR	Secretary of the Air Force (SAF) : Various	0.000	8.886	Jul 2020	0.000		0.000		-		0.000	0.000	8.886	0.000
Capability Development Program - Electronic Protection - CCDC	MIPR	CCDC AVMC : AL	25.504	0.000		4.500	Nov 2020	0.000		-		0.000	0.000	30.004	0.000
Capability Development Program - Enhanced Discrimination	C/CPAF	Raytheon : MA	266.242	25.581	Jan 2020	42.515	Jan 2021	21.755	Jan 2022	-		21.755	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MD11 / *BMDS Radars*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Capability Development Program - Enhanced Discrimination - LM	SS/CPIF	Lockheed Martin : NJ	5.922	0.000		6.670	Dec 2020	1.900	Dec 2021	-		1.900	Continuing	Continuing	Continuing
Capability Development Program - Network and Infrastructure Services	C/CPAF	Jacobs Engineering : AL, CO, MA, VA	0.000	6.086	Nov 2019	6.290	Nov 2020	6.176	Nov 2021	-		6.176	Continuing	Continuing	Continuing
Capability Development Program - Post Intercept Assessment (PIA)	C/CPAF	Raytheon : MA	10.400	0.000		0.000		0.000		-		0.000	0.000	10.400	0.000
Capability Development Program - SBX Capability Development	MIPR	CCDC AVMC : AL	0.000	0.907	Nov 2019	0.000		4.417	Nov 2021	-		4.417	Continuing	Continuing	Continuing
Capability Development Program - SBX Capability Development - includes Post Intercept Assessment (PIA)	SS/CPAF	Raytheon : MA	8.700	10.881	Mar 2020	4.776	Jan 2021	0.000		-		0.000	0.000	24.357	0.000
Capability Development Program - UEWR Capability Development - CCDC	MIPR	CCDC AVMC : AL	0.000	6.145	Dec 2019	5.000	Jun 2021	0.000		-		0.000	0.000	11.145	0.000
Sensors Directorate Operations - AN/TPY-2 WSMR Support	MIPR	WSMR : NM	0.000	0.617	Feb 2020	0.000		0.619	Oct 2021	-		0.619	Continuing	Continuing	Continuing
Sensors Directorate Operations - Army Hybrid Program Office	MIPR	SMDC : AL	8.919	1.197	Dec 2019	2.035	Dec 2020	1.436	Dec 2021	-		1.436	Continuing	Continuing	Continuing
Sensors Directorate Operations - Civilians/ Travel	Various	MDA : AL, VA, MA	203.606	17.693	Oct 2019	19.201	Oct 2020	19.484	Oct 2021	-		19.484	Continuing	Continuing	Continuing
Sensors Directorate Operations - Contractor Service Support	Various	Various : Various	242.510	21.505	Oct 2019	18.850	Oct 2020	14.431	Oct 2021	-		14.431	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MD11 / *BMDS Radars*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Sensors Directorate Operations - FFRDC/ UARC	SS/CPAF	GTRI, JHU/APL, MITRE, MIT/LL : AL, GA, MA, MD, VA	104.211	7.815	Nov 2019	7.815	Nov 2020	6.390	Nov 2021	-		6.390	Continuing	Continuing	Continuing
Sensors Directorate Operations - Network and Infrastructure Services	C/CPAF	Jacobs Engineering : AL, AK, CA, CO, HI, NM, VA	47.610	0.752	Jan 2020	0.292	Jan 2021	0.298	Jan 2022	-		0.298	Continuing	Continuing	Continuing
Sensors Directorate Operations - Network and Infrastructure Services - Network Management	C/FFP	Network Management Resources, Inc : VA	0.000	0.513	Aug 2020	0.000		0.000		-		0.000	0.000	0.513	0.000
Sensors Directorate Operations - Other Govt Agencies	MIPR	Various : Various	38.063	0.000		1.373	Feb 2021	0.482	Feb 2022	-		0.482	Continuing	Continuing	Continuing
Upgrade Clear Early Warning Radar - Facilities Site Activation/Admin Comms	MIPR	Various : AL, MA, AK	7.839	0.000		0.000		0.000		-		0.000	0.000	7.839	0.000
Upgrade Clear Early Warning Radar - Radar Upgrade -- Prime Contractor	C/CPAF	Raytheon : MA	130.452	3.172	Jan 2020	0.889	Jan 2021	1.701	Jan 2022	-		1.701	Continuing	Continuing	Continuing
Joint Emerging Operational Need (JEON) - Software Enhancements/ Development	C/CPAF	Raytheon : MA	55.000	15.900	Jan 2020	0.000		0.000		-		0.000	0.000	70.900	0.000
High Altitude Electromagnetic Pulse (HEMP) Hardening - FBM Site Modifications	MIPR	Various : Various	0.000	5.800	Mar 2020	0.000		0.000		-		0.000	0.000	5.800	0.000
High Altitude Electromagnetic Pulse (HEMP) Hardening - Hardened Transportable Terminal (HTT) Communications	MIPR	DISA : VA	0.000	1.227	Sep 2020	0.000		0.000		-		0.000	0.000	1.227	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MD11 / *BMDS Radars*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
High Altitude Electromagnetic Pulse (HEMP) Hardening - Hardened Transportable Terminal (HTT) Engineering, Development and Sustainment	MIPR	Tobyhanna Army Depot (TYAD) : PA	0.000	5.773	May 2020	0.000		0.000		-		0.000	0.000	5.773	0.000
High Altitude Electromagnetic Pulse (HEMP) Hardening - Power Distribution Centers (PDC) and Commercial Power	C/TBD	Various : Various	0.000	39.600	Mar 2020	0.000		0.000		-		0.000	0.000	39.600	0.000
High Altitude Electromagnetic Pulse (HEMP) Hardening - Power Distribution System (PDS) Development and Integration	SS/CPAF	Raytheon : MA	0.000	16.600	Mar 2020	0.000		0.000		-		0.000	0.000	16.600	0.000
		Subtotal	1,838.091	308.276		253.045		197.816		-		197.816	Continuing	Continuing	N/A

Remarks

Note: Clear Early Warning Upgrade Program includes upgrade of the Cape Cod EWR.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		-		-		-		-	-	-	N/A

Remarks

Operations and sustainment of Upgraded Early Warning Radar (UEWR), COBRA DANE (CD), and Army Navy/Transportable Radar Surveillance and Control (AN/TPY-2) Radars Contract Logistics Support (CLS) are Operations and Maintenance (O&M) Defense-Wide appropriations and are described in the Missile Defense Agency (MDA) O-Documents.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MD11 / *BMDS Radars*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			-	-		-		-		-		-	-	-	N/A

Remarks

N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			-	-		-		-		-		-	-	-	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,838.091	308.276		253.045		197.816		-		197.816	Continuing	Continuing	N/A

Remarks

Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MD11 / *BMDS Radars*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
GTI-20 Sprint 1(E/C) (MDS Ground Test)	✦																											
(EX) EAGLE RESOLVE 20	▲																											
GTI-20 Sprint 2 (JEON) (MDS Ground Test)		✦																										
Site 4c SICO (MDS Ground Test)			✦																									
GTI-08a (N/I) (MDS Ground Test)			✧	✧	✧	✧	✧																					
(EX) AIR AND MISSILE DEFENSE EXERCISE 21				✦	✦	✦																						
FS-21 E4 (AEGIS 5.1, DT Intercept Flight Test)						△																						
FTX-43 (OTHER, DT Tracking Exercise Flight Test)						△																						
TH CTV-01 (LTPO, DT Interceptor Only Flight Test)							△																					
FTT-21 (TH, DT Intercept Flight Test)							△																					
SNG-S-H-4							◇																					
SNG-A-H-4							◇																					
GTI-ISR (21) (MDS Ground Test)								✧																				
GTI-09 Sprint 1 (E/C) (MDS Ground Test)								✧																				
SNG-A-D-3								◇																				
SNG-S-D-5								◇																				
SNG-U-D-4								◇																				
SNG-C-D-2								◇																				
(EX) AIR AND MISSILE DEFENSE EXERCISE 22								✧	✧	✧																		
(EX) EAGLE RESOLVE 22									△																			
GTD-08a (N/I) (MDS Ground Test)									✧																			
SNG-U-H-3									◇																			
FTM-46 (AEGIS 5.0, DT/OT Intercept Flight Test)									△																			
GTI-09 Sprint 2 (E/C) (MDS Ground Test)									✧	✧																		

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MD11 / *BMDS Radars*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
GTI-08b Sprint 1 (N/I) (MDS Ground Test)											✧																	
FTX-45											△																	
FTX-26 (OT) (SN, OT Target Only Flight Test)												△																
GTD-09 (E/C) (MDS Ground Test)												✧																
SNG-S-D-4												◇																
SICO-08b (MDS Ground Test)												✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MD11 / *BMDS Radars*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
GTI-20 Sprint 1(E/C) (MDS Ground Test)	2	2020	2	2020
(EX) EAGLE RESOLVE 20	2	2020	2	2020
GTI-20 Sprint 2 (JEON) (MDS Ground Test)	3	2020	3	2020
Site 4c SICO (MDS Ground Test)	4	2020	4	2020
GTI-08a (N/I) (MDS Ground Test)	4	2020	4	2021
(EX) AIR AND MISSILE DEFENSE EXERCISE 21	1	2021	3	2021
FS-21 E4 (AEGIS 5.1, DT Intercept Flight Test)	3	2021	3	2021
FTX-43 (OTHER, DT Tracking Exercise Flight Test)	3	2021	3	2021
TH CTV-01 (LTPO, DT Interceptor Only Flight Test)	4	2021	4	2021
FTT-21 (TH, DT Intercept Flight Test)	4	2021	4	2021
SNG-S-H-4	4	2021	4	2021
SNG-A-H-4	4	2021	4	2021
GTI-ISR (21) (MDS Ground Test)	1	2022	1	2022
GTI-09 Sprint 1 (E/C) (MDS Ground Test)	1	2022	1	2022
SNG-A-D-3	1	2022	1	2022
SNG-S-D-5	1	2022	1	2022
SNG-U-D-4	1	2022	1	2022
SNG-C-D-2	1	2022	1	2022
(EX) AIR AND MISSILE DEFENSE EXERCISE 22	1	2022	3	2022
(EX) EAGLE RESOLVE 22	2	2022	2	2022
GTD-08a (N/I) (MDS Ground Test)	2	2022	2	2022
SNG-U-H-3	2	2022	2	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MD11 / *BMDS Radars*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
FTM-46 (AEGIS 5.0, DT/OT Intercept Flight Test)	2	2022	2	2022
GTI-09 Sprint 2 (E/C) (MDS Ground Test)	2	2022	3	2022
GTI-08b Sprint 1 (N/I) (MDS Ground Test)	3	2022	3	2022
FTX-45	3	2022	3	2022
FTX-26 (OT) (SN, OT Target Only Flight Test)	4	2022	4	2022
GTD-09 (E/C) (MDS Ground Test)	4	2022	4	2022
SNG-S-D-4	4	2022	4	2022
SICO-08b (MDS Ground Test)	4	2022	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / *Ballistic Missile Defense Sensors*	Project (Number/Name) MC11 / *Cyber Operations*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MC11: *Cyber Operations*	15.048	28.296	1.558	17.203	-	17.203	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Increase from FY 2021 to FY 2022 provides for critical cybersecurity requirements to support 12 AN/TPY-2 radars, SBX, five UEWRs, Cobra Dane, and LRDR.

A. Mission Description and Budget Item Justification

Sustain the Department of Defense Instruction (DoDI) 8510.01 Risk Management Framework (RMF) for DoD Information Technology (IT) requirement for the MDA Sensors Directorate and conduct Security Control Assessments (SCA) activities, analysis of validation results, risk assessments, and reviews of proposed Program Manager/Information System Security Manager (PM/ISSM) Plans of Action and Milestones (POA&M) for MDA Sensors mission systems. It also includes support for external cybersecurity assessments and penetration testing of the Sensors mission systems, both in laboratory Element Cybersecurity Experiments and in ground test activities, in accordance with the Director, Operational Test and Evaluation (DOT&E) directive and the Integrated Master Test Plan (IMTP). It maintains the Assessment and Authorization (A&A) data repository, capturing the RMF documentation (artifacts, validation results, Cybersecurity Risk Assessment results, cybersecurity scorecard, and Authorizing Official (AO) authorization decisions) and POA&M for all MDA information systems. This project supports the alignment, development, and implementation of an integrated Tier 2 Cyber Security Service Provider (CSSP) capability on the Sensors mission systems in accordance with the DoD Cybersecurity Discipline Implementation Plan and DoDI 8530.01 Cybersecurity Activities Support to DoD Information Network Operations.

Provides the monitoring, prioritization, and tracking of Cybersecurity mitigation detailed in Information Technology security POA&Ms. The activities include preparation of A&A documentation and accreditation recommendations to the MDA Senior Information Security Officer (SISO)/Security Control Assessor (SCA) and Authorizing Official (AO). Independent Verification and Validation (IV&V) team actions ensure the availability, integrity, authentication, confidentiality, and non-repudiation of the MDA mission; test; and administrative systems. These activities are necessary to comply with the Federal Information Security Management Act (FISMA).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Network / System Certification and Accreditation (C&A)	28.296	1.558	17.203
Articles:	-	-	-
Description: Cyber Operations funds Sensors Directorate Information System Security Manager (ISSM) civilian salaries and cybersecurity engineering and architecture planning for program information technology systems. This project plans and tests the cybersecurity controls for the Missile Defense System (MDS) and maintains Sensors Risk Management Framework (RMF) authorizations for Sensors-managed information systems, conducts Controls Validation Testing (CVT)/ Security Controls Assessment (SCA) of sensors mission and support systems, and provides and maintains Plans of Action and Milestones (POA&M) to mitigate cybersecurity deficiencies. Cyber Operations conducts annual cybersecurity program reviews on the Sensors enclaves to assess compliance in implementing and maintaining controls. This effort supports the alignment,			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MC11 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
development, and implementation of an integrated Tier 2 Cyber Security Service Provider (CSSP) capability on the Sensors mission systems in accordance with the DoD Cybersecurity Discipline Implementation Plan and DoDI 8530.01 Cybersecurity Activities Support to DoD Information Network Operations. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -Funds FY 2021 cybersecurity manpower only ***FY 2022 Plans:*** -Increase scope and complexity of portfolio of systems/networks managed, including implementation of RMF requirements for Hardware in the Loop (HWIL) and lab architectures and flight and ground test support architectures. Additional RMF compliance efforts for critical modeling and simulation/stimulation capabilities for both software-based modeling and HWIL testing. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides for critical cybersecurity requirements to support 12 AN/TPY-2 radars, SBX, five UEWRs, CD, and LRDR as well as mission support and ground and flight test assets.			
Accomplishments/Planned Programs Subtotals	28.296	1.558	17.203

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603896C: *Ballistic Missile Defense Command and Control, Battle Management & Communication*	550.513	645.741	603.448	-	603.448	-	-	-	-	-	-
• 0603898C: *Ballistic Missile Defense Joint Warfighter Support*	51.095	49.560	50.594	-	50.594	-	-	-	-	-	-
• 0603904C: *Missile Defense Integration and Operations Center (MDIOC)*	54.783	55.356	52.403	-	52.403	-	-	-	-	-	-
• 0603907C: *Sea Based X-Band Radar (SBX)*	137.604	118.318	147.241	-	147.241	-	-	-	-	-	-
• 0604672C: *Homeland Defense Radar-Hawaii*	181.569	133.000	0.000	-	0.000	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MC11 / *Cyber Operations*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0604673C: *Pacific Discriminating Radar*	2.921	0.000	0.000	-	0.000	-	-	-	-	-	-
• 0604873C: *Long Range Discrimination Radar (LRDR)*	131.135	138.317	133.335	-	133.335	-	-	-	-	-	-
• 0604879C: *Ballistic Missile Defense Sensor Test*	96.082	64.245	77.428	-	77.428	-	-	-	-	-	-
• 0901598C: *Management HQ - MDA*	27.065	26.902	24.102	-	24.102	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / *Ballistic Missile Defense Sensors*	Project (Number/Name) MC11 / *Cyber Operations*	

Support ($ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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
Network / System Certification and Accreditation (C&A) - AN/TPY 2 CSSP Development and Implementation	SS/CPAF	Raytheon : MA	0.000	8.680	Feb 2020	0.000		0.470	Oct 2021	-		0.470	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - AN/TPY 2 Cybersecurity Compliance	SS/CPAF	Raytheon : MA	0.000	6.345	Jan 2020	0.000		3.075	Oct 2021	-		3.075	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - CND/IA Advisory and Assistance Services (Booz Allen) - Consolidated in Contract Support Services	C/CPFF	Booz Allen Hamilton : AL, CO, VA	5.134	0.000		0.000		0.000		-		0.000	0.000	5.134	0.000
Network / System Certification and Accreditation (C&A) - CND/IA Advisory and Assistance Services (Torch Technologies) - Consolidated in Contract Support Services	C/CPFF	Torch Technologies : AL, CO, VA	2.641	0.000		0.000		0.000		-		0.000	0.000	2.641	0.000
Network / System Certification and Accreditation (C&A) - Civilian Salaries/Travel	Various	MDA : AL, CO, VA	1.255	0.371	Oct 2019	0.333	Oct 2020	0.466	Oct 2021	-		0.466	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Contract Support Services	Various	MDA : Various	0.000	4.522	Nov 2019	1.225	Oct 2020	4.535	Nov 2021	-		4.535	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) -	SS/CPAF	Raytheon : MA	6.018	3.831	Mar 2020	0.000		0.000		-		0.000	0.000	9.849	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / *Ballistic Missile Defense Sensors*	Project (Number/Name) MC11 / *Cyber Operations*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Cybersecurity Supply Chain Compliance															
Network / System Certification and Accreditation (C&A) - LRDR Cybersecurity Compliance	SS/FPIF	Lockheed Martin : NJ	0.000	3.221	Mar 2020	0.000		1.186	Oct 2021	-		1.186	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - SBX Cybersecurity Compliance	MIPR	Military Sealift Command : VA	0.000	1.326	Feb 2020	0.000		3.430	Oct 2021	-		3.430	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Sensors Test Cybersecurity Compliance	Various	Various : AK, AL, CO, VA	0.000	0.000		0.000		0.986	Oct 2021	-		0.986	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Systems Engineering Cybersecurity	MIPR	Various : AL, CO, VA	0.000	0.000		0.000		3.055	Oct 2021	-		3.055	Continuing	Continuing	Continuing
		Subtotal	15.048	28.296		1.558		17.203		-		17.203	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	15.048	28.296		1.558		17.203		-		17.203	Continuing	Continuing	N/A

Remarks

Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MC11 / *Cyber Operations*

Significant Event Complete ▲ Milestone Decision Complete ★ Element Test Complete ◆ System Level Test Complete ● Complete Activity ✦
Significant Event Planned △ Milestone Decision Planned ☆ Element Test Planned ◇ System Level Test Planned ○ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
Risk Management Framework (RMF) Assessment and Authorization (A&A) package preparation and submission	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Cyber Security Program Policy / Risk Management	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Cyber Security Mitigation Monitoring and Tracking	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
BMDS Cyber Security Policy Development	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Integrated Cyber Security Service Provider	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MC11 / *Cyber Operations*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Risk Management Framework (RMF) Assessment and Authorization (A&A) package preparation and submission	1	2020	4	2022
Cyber Security Program Policy / Risk Management	1	2020	4	2022
Cyber Security Mitigation Monitoring and Tracking	1	2020	4	2022
BMDS Cyber Security Policy Development	1	2020	4	2022
Integrated Cyber Security Service Provider	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / *Ballistic Missile Defense Sensors*	Project (Number/Name) MD40 / *Program-Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program-Wide Support*	110.919	11.784	11.200	9.731	-	9.731	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency program elements (PEs) each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	11.784	11.200	9.731
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment,			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MD40 / *Program-Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the PWS allocation on a pro-rata basis across multiple Agency PE's each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.			
Accomplishments/Planned Programs Subtotals	11.784	11.200	9.731

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884C / *Ballistic Missile Defense Sensors*	Project (Number/Name) MD40 / *Program-Wide Support*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Facilities and Maintenance	MIPR	Various Multi: : AL, CO, CA, VA	0.000	0.000		11.200	Nov 2020	0.000		-		0.000	0.000	11.200	0.000
Program Wide Support - Agency Operations Management	C/CPAF	Various : Multi: AL, CA, CO, VA	8.423	0.177	Jul 2020	0.000		0.000		-		0.000	0.000	8.600	0.000
Program Wide Support - Agency Operations and Support Civilian Salaries, Travel, Training	Various	Various MDA Multi: : AL, CO, CA, VA	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Other Agency Services	MIPR	Various : AK, AL, CO, CA, HI, MD, VA	11.247	2.234	Jul 2020	0.000		0.000		-		0.000	0.000	13.481	0.000
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AK, AL, CO, CA, HI, MD, VA	76.118	9.373	Aug 2020	0.000		9.731	Nov 2021	-		9.731	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations, Sustainment and GPC	C/FFP	Various : Multi: AK, AL, CA, HI, NY, VA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	0.000
Program Wide Support - Prior year no longer funded in the FYDP	Various	Various : Various	15.131	0.000		0.000		0.000		-		0.000	0.000	15.131	0.000
		Subtotal	110.919	11.784		11.200		9.731		-		9.731	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	110.919	11.784		11.200		9.731		-		9.731	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884C / *Ballistic Missile Defense Sensors*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

THIS PAGE INTENTIONALLY LEFT BLANK

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 0603890C / *BMD Enabling Programs*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	3,179.754	630.196	616.455	595.301	-	595.301	-	-	-	-	-	-
MD24: *System Engineering & Integration*	1,205.752	168.022	174.753	167.118	-	167.118	-	-	-	-	-	-
MD21: *Homeland Cruise Missile Defense Architecture*	-	0.000	3.000	13.921	-	13.921	-	-	-	-	-	-
MT23: *Enabling - Test*	112.912	58.143	49.293	41.576	-	41.576	-	-	-	-	-	-
MD28: *Intelligence & Security*	279.811	42.554	42.501	39.550	-	39.550	-	-	-	-	-	-
MD30: *BMD Information Management Systems*	565.001	86.992	84.753	92.729	-	92.729	-	-	-	-	-	-
MC30: *Cyber Operations*	159.570	115.404	64.659	78.248	-	78.248	-	-	-	-	-	-
MD31: *Modeling & Simulation*	347.084	82.344	107.710	87.068	-	87.068	-	-	-	-	-	-
MC31: *Engineering Cyber Operations*	30.822	23.322	35.709	22.462	-	22.462	-	-	-	-	-	-
MD32: *Quality, Safety, and Mission Assurance*	294.540	29.780	30.269	29.527	-	29.527	-	-	-	-	-	-
MD40: *Program-Wide Support*	184.262	23.635	23.808	23.102	-	23.102	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

Decrease from FY 2021 to FY 2022 reflects transition from development to implementation of the initial Enterprise digital Models and Simulations (M&S) product, completion of the Joint Emergent Operational Need (JEON) in FY 2021, and consolidation of Cyber Engineering activities within Systems Engineering processes.

Beginning in FY 2021, this Program Element includes Cruise Missile Defense of the Homeland architecture design and fire control demonstration, in response to USNORTHCOM requirements.

A. Mission Description and Budget Item Justification

The Missile Defense System (MDS) Enabling Programs provide critical products and processes needed to combine element missile defense capabilities into a single, integrated and layered System to counter existing threats and provide new defensive capabilities against emerging threats. Specifically, the Enabling Programs:
- Assess architecture alternatives and new technologies to address advanced threats, define MDS functional requirements, conduct Analyses of Alternatives (AoA) for the DoD, and provide engineering requirements, execution support, and pre- and post-mission analysis for System-level tests

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0603890C *I BMD Enabling Programs*

- Provide System-level engineering required to develop and demonstrate Cruise Missile Defense of the Homeland
- Provide validated models and simulations for System assessment
- Assess and document System performance (through data collection and analysis) and deliver capabilities to the Warfighter
- Provide multi-disciplinary security and intelligence support for acquisition, development, test, and deployment of current and future MDS capabilities
- Identify potential threats and vulnerabilities to MDA and the MDS and develop and implement strategies to mitigate those risks
- Provide Information Management tools and products supporting the development of MDS capabilities while safeguarding networks and critical program information
- Provide MDA secure communication networks, IT systems, special purpose processing nodes, operations and monitoring centers, and disaster recovery and continuity of operations requirements
- Evaluate quality, technical safeguards, and mission assurance effectiveness
- Assess System ability to maintain integrity and superiority with advances in technology development

This Program Element also funds MDS threat discrimination capability development to enhance MDS effectiveness against the evolving adversary threat. The end result will be an MDS architecture more capable of identifying and destroying reentry vehicles with a higher degree of confidence, improving Warfighter shot doctrine, and more efficiently using interceptor inventory. MDS threat discrimination development is funded from the Enabling (0603890C); Midcourse (0603882C); BMD Sensors (0603884C); BMD Command, Control, Battle Management and Communications (C2BMC) (0603896C); and Aegis BMD (0603892C) PEs.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	634.449	599.380	552.815	-	552.815
Current President's Budget	630.196	616.455	595.301	-	595.301
Total Adjustments	-4.253	17.075	42.486	-	42.486
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	17.075			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	4.675	0.000			
• SBIR/STTR Transfer	-12.537	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	3.609	0.000	42.486	-	42.486

Change Summary Explanation

FY 2020 does not include the enacted rescission of $2.031 million to BMD Enabling.

Increase in FY 2021 provides Congressional adds for architecture reactive target simulation development, cruise missile defense for homeland indications and warning, and a portion of the undistributed Congressional add to restore DWR Missile Defense Agency manpower reduction.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0603890C *I BMD Enabling Programs*

Increase in FY 2022 provides for Cruise Missile Defense engineering, Layered Homeland Defense engineering, System-level engineering support for the Ground-based Midcourse Defense Next Generation Interceptor, and Information Technology improvements.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD24 / *System Engineering & Integration*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD24: *System Engineering & Integration*	1,205.752	168.022	174.753	167.118	-	167.118	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2021 to FY 2022 reflects completion of both the JEON effort and the architecture-reactive target simulation development effort (FY 2021 Congressional adjustment).

A. Mission Description and Budget Item Justification

System Engineering & Integration (SE&I) defines, designs, tests and integrates the MDS, and provides analysis, decision support and planning activities for real-world operations to the National Command Authority, Joint Staff, Military Services, Combatant Commanders, Operational Test Agencies, Director of Operational Test and Evaluation, Allies, and others.

The SE&I Major Program Goals are:
- Plan, design, develop, integrate, and test a layered MDS that provides the required performance
- Provide system-level engineering support to the MDS Elements, and lead collaborative cross-Element, cross-Component engineering
- Analyze architecture alternatives and new technologies, and develop requirements to respond to the proliferation of short, medium, and long range advanced missile threats
- Provide a more effective missile defense capability for U.S. deployed forces, allies, and partners, and enhance homeland defense
- Develop discrimination improvements for the Homeland and Regional Defense missions
- As technical authority for Integrated Air and Missile Defense (IAMD), provide a consistent, disciplined systems engineering process using a multi-Service team to integrate Joint IAMD systems
- Provide technical direction to Element and Component developers and provide System-level forums to track, assess, and improve hardware and software reliability
- Identify MDS capabilities and limitations
- Develop performance assessment requirements, verify MDS performance through testing, and conduct assessments to form the basis for technical capability declarations in support of fielding decisions
- Identify critical conditions and data required to develop test campaigns to demonstrate MDS performance
- Define the test objectives necessary to anchor System-level models and simulations and enable independent verification and validation
- Identify System issues occurring in ground and flight tests and lead the effort to resolve them
- Ensure the MDS is complementary to and interoperable with North Atlantic Treaty Organization (NATO) and other theater systems
- Develop anti-tamper approaches to enable international fielding

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD24 / *System Engineering & Integration*

The MDS threat discrimination improvements and countermeasures mitigation effort will develop and field integrated Element capabilities to improve the capability to identify lethal reentry vehicles and non-lethal threat objects. SE&I will conduct analysis and engineering to specify the MDS functional, performance, and interface requirements for achieving the improved capabilities.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Requirements and Design	37.908	33.133	47.623
Articles:	-	-	-
Description: The Requirements and Design effort develops Missile Defense System (MDS) level requirements and specifications and drives the integration of the MDS. Requirements and Design allocates requirements to MDS Elements and adjudicates Element level specifications to provide required capabilities for the Warfighter. - Define MDS technical content expectations and develop system requirements to address evolving threats - Develop and allocate functional performance, interface, and design suitability requirements to Programs, in collaboration with MDS element engineers - Maintain and update Phased Implementation Plan to document integrated requirements for improvements to, or augmentations of, current system capabilities - Deliver system technical baseline updates to document integrated system build content as identified in the R-4 summary - Identify and resolve technical disconnects through the requirements trace process and element certifications; conduct engineering analyses and perform trade studies - Participate in Element Requirements Reviews to assess compliance with MDS design - Develop Specification Change Notices (SCN) for future requirements changes, to include mitigation strategies to address discrepancy reports - Ensure accurate reporting of Element functionality and software / hardware integration in the Missile Defense System Accountability Report (MDAR) and Director's Program Reviews - Assess and add emerging threats to MDA's lethality prediction models - Incorporate updates to lethality assessments, collateral effects, and consequences of intercept into the MDS Lethality Program Plan Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - Develop System-level requirements to address advanced threats ***FY 2022 Plans:*** - Provide System-level engineering support for Next Generation Interceptor (NGI) development: -- Ensure NGI designs meet lethality requirements and conduct risk reduction activities: Develop and conduct lethality modeling and simulation, plan and conduct Light Gas Gun testing, collect data to anchor and validate developed models, and conduct analysis			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD24 / *System Engineering & Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Conduct System-level engineering in support of Layered Homeland Defense (LHD), including requirements definition and Post-Intercept Debris analysis -- Develop requirements for C2BMC integrated battle management capability and updates to current sensor and weapon systems to enable the Mid-term LHD capability. Develop functional, interface requirements, and geographic specific performance requirements. -- Develop tailored Homeland Defense Radar functional, interface, design suitability, and performance requirements, to include discriminating radars -- Update analytical tools -- Develop digital prototype to predict initial Post Intercept Debris (PID) environments resulting from hit-to-kill missile defense engagements -- Initiate PID algorithm development and high fidelity intercept modeling to inform MDS system requirements ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase in funding from FY 2021 to FY 2022 provides System-level engineering required to incorporate LHD and NGI capabilities into the MDS.			
Title: Integrated Air and Missile Defense (IAMD)	15.092	17.052	17.991
Articles:	-	-	-
Description: The IAMD effort provides a consistent, disciplined systems engineering process using a joint service systems engineering team to develop the technical requirements necessary to support integration of joint service IAMD systems, implementing capabilities required by the Geographic Combatant Commands. This effort includes systems engineering analysis, development of technical and interface control requirements and documents, definition of candidate Joint IAMD increments, model improvements, and configuration control across the joint systems. IAMD provides improved performance such as an improved air picture to enable engagement coordination decision making, increase battlespace, and improve track continuity. Additional efforts will address critical joint Command and Control and interoperability needs such as Joint Integrated Fire Control (IFC) and the development of a Joint IFC network to enable the capability to provide fire control quality data from the right sensor to the right shooter to engage the right target. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - Conduct engineering investigations and evaluation of Advanced Association Algorithms to improve overall joint IAMD Tracking Capabilities - Conduct analysis into existing and emerging IAMD capabilities to ensure they are appropriately represented during Ballistic Missile Defense (BMD) and IAMD wargames/exercises - Continue engineering activities supporting critical Joint Command and Control and interoperability needs:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD24 / *System Engineering & Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-- Continue to advance improvements in combat identification integration and interoperability among Joint Integrated Air and Missile Defense systems and the ability to represent these advanced capabilities within a engineering level Modeling and Simulation environment -- Working with the Joint Staff Joint Integrated Air and Missile Defense Organization (JIAMDO), translate identified Engagement Coordination Initial Capability Document requirements into to technical requirements for implementation within Services and Agency existing and developing programs of record to improve Engagement Coordination and implement advanced fire control capabilities across the Joint Integrated Air and Missile Defense kill-chain ***FY 2022 Plans:*** - Continue engineering investigations and evaluation of Advanced Association Algorithms to improve overall joint IAMD Tracking Capabilities to include radar and Electro-Optical / Infrared (EO/IR) data and start transition efforts to realize functionality - Conduct analysis into existing and emerging IAMD capabilities to ensure they are appropriately represented during BMD and IAMD wargames/exercises. Continue to expand use of representative wargames and exercises - Enhance Models and Simulations (M&S) to support participation in annual Nimble Fire exercises - Continue engineering activities supporting critical Joint Command and Control and interoperability needs: -- Continue to advance improvements in combat identification integration and interoperability among Joint Integrated Air and Missile Defense systems and to start the implementation of these advanced capabilities across the Army, Navy, Air Force and Marine Corps systems -- Working with JIAMDO, continue to analyze, assess and translate identified Engagement Coordination Initial Capability Document requirements in to technical requirements for implementation within Services and Agency existing and developing programs of record to improve Engagement Coordination and implement advanced fire control capabilities across the Joint Integrated Air and Missile Defense kill-chain - Working within the various Joint All Domain Command and Control (JADC2) Working Groups and Integrated Product Teams, ensure IAMD Technical Authority efforts are in alignment and compatible with the direction of the other Services with respect to JADC2 capabilities - Start working with the Army and USCENTCOM in support of the analysis, assessment and development of Counter - Unmanned Aerial Systems (C-UAS) capabilities ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: System-Level Verification and Assessment	24.680	23.082	25.703
Articles:	-	-	-
Description: This activity funds Missile Defense System Assessment and Verification, Validation, and Accreditation (VV&A) activities to support Operational Capacity Baseline (OCB) delivery decisions and Technical Capability Declarations (TCDs), and anchor System modeling and simulation.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD24 / *System Engineering & Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Develop and manage assessment plans and requirements for MDS capability increments: -- Map assessment requirements to data collection venues (i.e., ground tests, flight tests, and exercises) -- Evaluate current Modeling & Simulation (M&S) capability to address assessment requirements, and provide recommendations for new or improved M&S - Maintain assessment documentation per the R-4 summary - Conduct extensive analysis of data collected in MDS ground and flight test events to characterize MDS interoperability and performance, and anchor models and simulations - Identify mitigation approaches for system performance issues uncovered during the course of analysis and assessment - Monitor development and recommend improvements to the simulation enterprise based on an evaluation of the validity of Component, Element and System-level models (and frameworks) and participation in assessment activities and Modeling and Simulation events - Continue VV&A activities to meet and maintain Hardware-in-the-Loop (HWIL) model accreditation in accordance with the HWIL Accreditation plan - Conduct assessments of Missile Defense System capabilities and limitations prior to capability delivery decisions - Produce independent assessments of each incremental MDS Capability Delivery to support fielding readiness determinations - Verify MDS performance against specified requirements, and produce MDS verification reports - Maintain M&S VV&A database and toolkit - Maintain verification data for System Specification Change Notices - Recommend solutions to improve assessment confidence, including M&S and testing issue resolutions Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - Conduct VV&A and assessment of the Long Range Discrimination Radar (LRDR) ***FY 2022 Plans:*** - Conduct VV&A of MDS Core Truth Models, to include debris and plume modeling. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides for additional System-level verification activities to support accreditation and increase Warfighter confidence in deployed capabilities.			
Title: Knowledge Centers	13.380	14.319	12.679
Articles:	-	-	-
Description: Knowledge Centers serve as independent technical advisors to MDA program offices in the C2BMC, Interceptor, Space, and Sensor areas to support development of technical approaches and improve reliability.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD24 / *System Engineering & Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Provide Federally Funded Research and Development Centers (FFRDC) and University Affiliated Research Centers (UARC) subject matter expertise, to include reach-back capability as needed, for Element program managers: -- Provide Subject Matter Expertise and analytical support for Independent Review Teams, mission assurance assessments, Failure Review Boards and Failure Investigation Teams -- Identify and provide recommendations to mitigate technical risks, including innovative and unconventional approaches -- Promote knowledge sharing between external technical sources and MDA - Perform independent technical assessments of critical System and Element program issues: -- Define element knowledge points (KPs), establish closure criteria, and provide closure recommendations -- Continue to provide System and Element performance assessments - Conduct assessments of emerging technologies as required Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease in funding from FY 2021 to FY 2022 reflects consolidation of Knowledge Center FFRDC/UARC resources.			
Title: Future Concepts and Planning	14.024	23.632	13.451
Articles:	-	-	-
Description: This activity funds MDS architecture and future concept development, and efforts and studies to address the emergent threat, including DoD Analyses of Alternatives (AoA). - Participate in designated Office of the Secretary of Defense (OSD) activities or analyses, as directed by Congress - Perform MDS capability gap analysis, and analyze and document architecture alternatives and/or new technologies to address gaps - Develop architecture overviews, capability evolution plans, integrated system schedules, and top-level requirements - Develop Initial Requirements Documents (IRDs) to establish functional, performance and integration planning requirements for next generation weapons and sensors to counter future threats - Identify architecture alternatives that improve MDS performance and are complementary to and interoperable with North Atlantic Treaty Organization (NATO) systems and theaters around the world - Conduct technology development reviews for future/follow-on MDS Element development efforts			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD24 / *System Engineering & Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Update concept capability documentation based on architectural options, trade studies, and technology development experiments - Develop Preliminary Specification Change Notices for selected future MDS capabilities and technologies - Maintain a dialog with the Warfighter community for all MDS engineering and technical issues -- Inform Warfighter development of the Prioritized Capabilities List (PCL) by providing relevant System data -- Develop updates to the Achievable Capabilities List (ACL) as required - Lead collaborative effort to improve foreign partners' understanding of existing system capabilities, architectural performance and operational concepts of the MDS Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - Conduct architecture-reactive target simulation development for design and assessment of architecture alternatives. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects completion of Congressionally-added architecture-reactive target simulation development effort.			
Title: System Engineering, Engineering Analysis and Quick Response Team	10.016	11.300	11.061
Articles:	-	-	-
Description: This task provides rapid response, high quality systems engineering analysis products and supporting technical data to address external and internal Agency inquiries and decisions: - Conduct system level analyses to support ongoing MDS Architecture and Systems Engineering efforts - Analyze expected performance of MDS Architecture options: -- Analyze and predict the performance of future MDS capabilities -- Provide technical assessments, and collaborate with MDS Elements to define and track technical performance measures - Respond to Warfighter, Combatant Command (CCMD) and congressional requests for information and analysis - Provide analytical support for real-world events - Maintain analysis parameters database and standards per the R4 summary to ensure consistency - Develop analytical data to respond to information requests from MDA and DoD leadership Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD24 / *System Engineering & Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Discrimination	21.716	23.553	20.462
Articles:	-	-	-
Description: MDA designs, develops, tests, and delivers MDS discrimination improvements and countermeasures mitigation capabilities to address emerging adversary countermeasures. MDA is focused on providing the Warfighter with capability improvements to identify Reentry Vehicles (RVs) within a threat missile complex in the presence of decoys and with advanced capabilities to address other countermeasures. SE&I will lead and integrate the Threat Discrimination program across the entire MDS, establish performance goals for the product development phase, and develop functional, performance, and interface requirements to address the threat. SE&I will establish threat discrimination and countermeasures mitigation ground and flight test requirements, and develop updated high fidelity threat models to support analysis and testing activities. Other activities include: - Perform systems engineering support for threat discrimination and counter-countermeasures analysis and assessments - Provide technical support for fielding improved threat discrimination capabilities Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - Perform discrimination systems engineering support for counter-countermeasures analysis, and assessments - Provide technical support for fielding improved discrimination capability - Conduct analysis on predicted performance of advanced algorithm development for definition of initial requirements - Develop Electronic Attack models to support MDS requirements definition for Electronic Protection techniques - Define operational concepts for improved counter-countermeasure techniques and technologies - Assess discrimination planning and reporting for MDS Increment 6C Technical Capability Declaration - Develop models and simulations for reactive/responsive Electronic Attack, objective debris mitigation, electro-optical/infrared improvements, advanced/dynamic threat, and high fidelity scene generation - Develop updated high fidelity threat models - Develop Preliminary Change Notice, Functional Specification Change Notice, Performance Specification Change Notice, and Document Change Notice for discrimination improvements, Electronic Protection, and Objective Debris Mitigation ***FY 2022 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD24 / *System Engineering & Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Conduct Threat Discrimination Program integration across the entire MDS - Perform threat discrimination systems engineering support for counter-countermeasures analysis and assessments - Provide technical support for fielding improved discrimination capability - Conduct analysis on predicted performance of advanced capability development for definition of initial requirements for MDS - Develop Electronic Attack and Electronic Protection models to support MDS requirements definition for Electronic Protection techniques - Define operational concepts for improved counter-countermeasure techniques and technologies - Support Ground/Flight test data collection planning efforts to enable MDS Increment 6C assessment - Develop models and simulations for Electronic Attack, Electronic Protection, Objective Debris Mitigation, electro-optical/infrared improvements, advanced/dynamic threat, and high fidelity scene generation to support test planning and execution - Develop updated high fidelity threat models - Develop Preliminary Change Notice, Functional Specification Change Notice, Performance Specification Change Notice, and Document Change Notice for threat discrimination improvements, Electronic Protection, and Objective Debris Mitigation ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects ramp-down in requirements definition and integration planning to align with current discrimination improvements implementation schedule.			
Title: Risk Management	8.076	7.820	7.901
Articles:	-	-	-
Description: The Risk Management task identifies MDS element and component technical risks, and tracks status and risk mitigation progress. - Convene and chair Risk Management Working Group - Execute the risk management and mission readiness working group process - Maintain a risk database using the Failure Reporting and Corrective Action System - Review and approve program element risks, on quarterly basis Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD24 / *System Engineering & Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
N/A			
Title: Anti-Tamper & Engineering Manufacturing Readiness Level Development	4.849	5.269	5.367
Articles:	-	-	-
Description: This task develops anti-tamper approaches to inhibit reverse engineering of critical technologies, and oversees the use of Engineering and Manufacturing Readiness Levels (EMRLs) to assess Element, Component, or System maturity. - Develop anti-tamper approaches to enable international fielding, support coalition warfare, and extend the effective operational life of the System - Engage and support the Services in understanding and transitioning MDS Element Anti-Tamper activities - Participate in Element reviews to assess proposed Anti-Tamper solutions and assist programs in developing and implementing Anti-Tamper detection and response technologies to mitigate risk - Monitor application of EMRLs to evaluate engineering and manufacturing maturity of MDS elements, systems, and components - Assess and report readiness of MDA development efforts for transition to production Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Manufacturing and Producibility	5.132	4.914	4.880
Articles:	-	-	-
Description: This activity supports a system-level manufacturing and producibility team to address materials, key component, and subsystem design and development to reduce cycle time, part count, and risk. This activity also supports a system-level reliability team to reduce risk of test failures and performance shortcomings and drive reliability into system and component designs. - Assess Missile Defense industrial base and determine critical manufacturing technologies -- Conduct assessments of critical component supply base and update critical technologies database -- Collaborate with national security space components on investment strategies for critical technologies -- Develop engineering management tool to characterize industrial base risks - Utilize supply chain risk identification and mitigation tracking system to mitigate manufacturing supply issues for critical components			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD24 / *System Engineering & Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Assess the effectiveness of reliability programs for each MDA Product (Radar, Launcher, Missile/Interceptor, etc.) to achieve/ sustain required reliability - Perform reliability, composite risk, and probability of mission success assessments for flight tests - Identify failure trends/modes and evaluate impact on the Probability of Mission Success; evaluate potential corrective actions -- Provide element/program scorecard data to support reliability evaluations/assessments - With Logistics Support, develop MDA Reliability and Logistic Policies/Plans to promote integrated sustainability efforts - Ensure that Missile Defense products have achieved the required maturity in Reliability, Availability, and Maintainability (RAM) to support the transition from MDA to the appropriate service organization; provide RAM expertise as needed to Element Program Offices - Provide updates to MDA RAM policy and guidance Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: JEON Capability	13.149	10.679	0.000
Articles:	-	-	-
Description: In conjunction with the Lower Tier Project Office (LTPO) for a Joint Emergent Operational Need (JEON), provide system-level engineering activities to develop, test and deploy an integrated solution for upper tier/lower tier integration by achieving enhanced interoperability between the Terminal High Altitude Area Defense (THAAD) and PATRIOT capabilities, including: - Develop threat updates to inform requirements - Develop functional, performance, and interface requirements - Develop test requirements - Update Modeling and Simulation (M&S) frameworks and core truth models - Provide M&S integration for testing, and provide Wargame and training support - Develop requirements for capability assessments - Provide test and performance analysis - Perform Element integration			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD24 / *System Engineering & Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** No funding is requested for this activity in FY 2022. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects completion of the JEON effort.			
Accomplishments/Planned Programs Subtotals	168.022	174.753	167.118

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603881C: *Ballistic Missile Defense Terminal Defense Segment*	295.312	312.317	277.949	-	277.949	-	-	-	-	-	-
• 0603882C: *Ballistic Missile Defense Midcourse Defense Segment*	1,275.414	1,219.261	745.144	-	745.144	-	-	-	-	-	-
• 0603884C: *Ballistic Missile Defense Sensors*	348.356	265.803	224.750	-	224.750	-	-	-	-	-	-
• 0603892C: *AEGIS BMD*	722.582	877.336	732.512	-	732.512	-	-	-	-	-	-
• 0603896C: *Ballistic Missile Defense Command and Control, Battle Management & Communication*	550.513	645.741	603.448	-	603.448	-	-	-	-	-	-
• 0603914C: *Ballistic Missile Defense Test*	398.939	365.208	362.906	-	362.906	-	-	-	-	-	-
• 0604181C: *Hypersonic Defense*	386.528	272.632	247.931	-	247.931	-	-	-	-	-	-

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD24 / *System Engineering & Integration*

D. Acquisition Strategy

In order to optimize the performance of the MDS, MDA leverages the nation's engineering Centers of Excellence at government agencies and Military Services, FFRDCs, UARCs, and industry. The executing agents utilize various contracting strategies in a flexible manner to maximize their contribution. Products and Services will be acquired by competitive means to the extent that is possible and practical.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD24 / *System Engineering & Integration*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Requirements and Design - Reqts & Design - Lethality Spt - FFRDC/ UARC	MIPR	Various : CA	3.906	0.963	Nov 2019	0.978	Nov 2020	0.995	Nov 2021	-		0.995	Continuing	Continuing	Continuing
Requirements and Design - Reqts & Design - Layered Homeland Defense Post Intercept Debris Analysis	Various	Various : AL, CO, VA, MA	0.000	0.000		0.000		6.084	Nov 2021	-		6.084	Continuing	Continuing	Continuing
Requirements and Design - Reqts & Design - Lethality Spt - CSS	C/CPFF	TEAMS : NC	2.328	0.604	Nov 2019	0.672	Nov 2020	0.686	Nov 2021	-		0.686	Continuing	Continuing	Continuing
Requirements and Design - Previous Year Reqts & Design Content No Longer in FYDP	Various	Various : Various	47.805	0.000		0.000		0.000		-		0.000	0.000	47.805	0.000
Requirements and Design - Reqts & Design	C/CPFF	TEAMS : AL, VA	44.181	8.211	Nov 2019	6.126	Nov 2020	6.753	Nov 2021	-		6.753	Continuing	Continuing	Continuing
Requirements and Design - Reqts & Design - FFRDC/UARC 1	MIPR	ORNL : TN	1.828	0.406	Nov 2019	0.415	Nov 2020	0.423	Nov 2021	-		0.423	Continuing	Continuing	Continuing
Requirements and Design - Reqts & Design - FFRDC/UARC 2	MIPR	MITRE : VA	5.376	1.219	Nov 2019	1.245	Nov 2020	0.423	Nov 2021	-		0.423	Continuing	Continuing	Continuing
Requirements and Design - Reqts & Design - HAENS Spt	MIPR	NSWC Crane : IN	3.735	0.498	Nov 2019	0.508	Nov 2020	0.518	Nov 2021	-		0.518	Continuing	Continuing	Continuing
Requirements and Design - Reqts & Design - Industry	C/CPFF	Boeing : AL	122.597	7.136	Nov 2019	6.742	Nov 2020	5.440	Nov 2021	-		5.440	Continuing	Continuing	Continuing
Requirements and Design - Reqts & Design - Layered Homeland Defense Systems Engineering and Requirements Definition	Various	Various : AL, CO, VA	0.000	0.000		0.000		5.556	Nov 2021	-		5.556	Continuing	Continuing	Continuing
Requirements and Design - Reqts & Design - MDA	Allot	MDA : AL, VA	62.871	8.289	Oct 2019	7.716	Nov 2020	7.946	Oct 2021	-		7.946	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD24 / *System Engineering & Integration*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Requirements and Design - Reqts & Design - NGI CSS support	Various	Various : AL	0.000	0.000		0.000		2.247	Nov 2021	-		2.247	Continuing	Continuing	Continuing
Requirements and Design - Reqts & Design - NGI Lab support	Various	Various : NM, CA, TX	0.000	0.000		0.000		5.091	Nov 2021	-		5.091	Continuing	Continuing	Continuing
Requirements and Design - Reqts & Design - NGI OGA support	MIPR	Various : AL, TN	0.000	0.000		0.000		2.700	Nov 2021	-		2.700	Continuing	Continuing	Continuing
Requirements and Design - Reqts & Design - OGA	MIPR	CCDC : AL	11.087	2.275	Nov 2019	2.376	Nov 2020	0.461	Nov 2021	-		0.461	Continuing	Continuing	Continuing
Requirements and Design - Reqts & Design - Post Intercept Assessment	Various	Various : Various	10.834	8.307	Nov 2019	6.355	Nov 2020	2.300	Nov 2021	-		2.300	Continuing	Continuing	Continuing
Integrated Air and Missile Defense (IAMD) - IAMD - MDA	Allot	MDA : AL, VA, CO	0.000	0.000		0.000		0.774	Oct 2021	-		0.774	Continuing	Continuing	Continuing
Integrated Air and Missile Defense (IAMD) - IAMD - OGA	MIPR	CCDC : AL	14.864	4.442	Nov 2019	4.862	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Air and Missile Defense (IAMD) - IAMD - Support	C/CPFF	TEAMS : AL, VA, CO	6.288	0.898	Nov 2019	1.609	Nov 2020	1.301	Nov 2021	-		1.301	Continuing	Continuing	Continuing
Integrated Air and Missile Defense (IAMD) - IAMD - Various	MIPR	DoD Activities : Various	52.165	9.752	Nov 2019	10.581	Nov 2020	15.916	Nov 2021	-		15.916	Continuing	Continuing	Continuing
Integrated Air and Missile Defense (IAMD) - Previous Year IAMD Content No Longer in FYDP	Various	Various : AL, VA, MD	6.520	0.000		0.000		0.000		-		0.000	0.000	6.520	0.000
System-Level Verification and Assessment - Previous Year Sys V&A content no longer in the FYDP	Various	Various : Various	12.236	0.000		0.000		0.000		-		0.000	0.000	12.236	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD24 / *System Engineering & Integration*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System-Level Verification and Assessment - Sys V&A - CSS	C/CPFF	TEAMS : AL	12.291	3.532	Nov 2019	2.685	Nov 2020	3.642	Nov 2021	-		3.642	Continuing	Continuing	Continuing
System-Level Verification and Assessment - Sys V&A - FFRDC/UARC 1	MIPR	Aerospace : CA	21.574	1.800	Nov 2019	1.825	Nov 2020	1.251	Nov 2021	-		1.251	Continuing	Continuing	Continuing
System-Level Verification and Assessment - Sys V&A - FFRDC/UARC 2	MIPR	JHU/APL : MD, VA	12.058	0.000		1.245	Nov 2020	1.270	Nov 2021	-		1.270	Continuing	Continuing	Continuing
System-Level Verification and Assessment - Sys V&A - FFRDC/UARC 3	MIPR	GTRI : AL	1.461	1.150	Nov 2019	1.175	Nov 2020	1.175	Nov 2021	-		1.175	Continuing	Continuing	Continuing
System-Level Verification and Assessment - Sys V&A - FFRDC/UARC 6	MIPR	MIT/LL : MA	21.298	1.450	Nov 2019	1.000	Nov 2020	0.829	Nov 2021	-		0.829	Continuing	Continuing	Continuing
System-Level Verification and Assessment - Sys V&A - FFRDC/UARC 7	MIPR	MITRE : VA	21.310	1.623	Nov 2019	1.641	Nov 2020	1.645	Nov 2021	-		1.645	Continuing	Continuing	Continuing
System-Level Verification and Assessment - Sys V&A - M&S Accreditation	Various	CCDC : AL	14.244	6.873	Dec 2019	2.836	Nov 2020	5.518	Nov 2021	-		5.518	Continuing	Continuing	Continuing
System-Level Verification and Assessment - Sys V&A - MDA	Allot	MDA : VA, AL	12.251	4.806	Oct 2019	6.326	Oct 2020	5.809	Oct 2021	-		5.809	Continuing	Continuing	Continuing
System-Level Verification and Assessment - Sys V&A - OGA	MIPR	CCDC : AL	14.255	2.490	Nov 2019	2.375	Nov 2020	4.090	Nov 2021	-		4.090	Continuing	Continuing	Continuing
System-Level Verification and Assessment - V&A Industry Support	C/CPFF	Boeing : AL	20.228	0.956	Nov 2019	1.974	Nov 2020	0.474	Nov 2021	-		0.474	Continuing	Continuing	Continuing
Knowledge Centers - KC - FFRDC/UARC 5	MIPR	Draper : VA	0.579	0.652	Nov 2019	0.665	Nov 2020	0.665	Nov 2021	-		0.665	Continuing	Continuing	Continuing
Knowledge Centers - KC - FFRDC/UARC 1	MIPR	Aerospace : CA	15.262	1.865	Nov 2019	1.902	Nov 2020	1.732	Nov 2021	-		1.732	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD24 / *System Engineering & Integration*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Knowledge Centers - KC - FFRDC/UARC 2	MIPR	MIT/LL : MA	10.011	1.069	Nov 2019	1.090	Nov 2020	1.090	Nov 2021	-		1.090	Continuing	Continuing	Continuing
Knowledge Centers - KC - FFRDC/UARC 3	FFRDC	MITRE : VA	10.440	1.084	Nov 2019	1.106	Nov 2020	1.106	Nov 2021	-		1.106	Continuing	Continuing	Continuing
Knowledge Centers - KC - FFRDC/UARC 4	FFRDC	JHU/APL : VA	8.914	0.714	Nov 2019	0.728	Nov 2020	0.728	Nov 2021	-		0.728	Continuing	Continuing	Continuing
Knowledge Centers - KC - FFRDC/UARC 7	MIPR	GTRI : GA	5.132	0.377	Nov 2019	0.385	Nov 2020	0.386	Nov 2021	-		0.386	Continuing	Continuing	Continuing
Knowledge Centers - KC - MDA	Various	MDA : AL, VA	39.376	3.800	Oct 2019	3.315	Oct 2020	2.359	Oct 2021	-		2.359	Continuing	Continuing	Continuing
Knowledge Centers - KC - TEAMS	C/CPFF	TEAMS : AL	5.908	2.414	Nov 2019	2.144	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Knowledge Centers - KC - Various	MIPR	Various : Various	9.836	1.405	Dec 2019	2.984	Dec 2020	4.613	Dec 2021	-		4.613	Continuing	Continuing	Continuing
Knowledge Centers - Previous Year KC Content No Longer In FYDP	Various	Various : AL, AK, CA, CO, HI, NM, VA	3.032	0.000		0.000		0.000		-		0.000	0.000	3.032	0.000
Future Concepts and Planning - Future Concepts - Architecture CSS	C/CPFF	TEAMS : AL, VA	17.969	5.212	Nov 2019	4.987	Nov 2020	6.313	Nov 2021	-		6.313	Continuing	Continuing	Continuing
Future Concepts and Planning - Architecture target simulation development	C/CPFF	Parsons : AL	0.000	0.000		10.000	Apr 2021	0.000		-		0.000	Continuing	Continuing	Continuing
Future Concepts and Planning - Future Concepts - Architecture Support	Various	Various : VA, AL	12.392	1.000	Nov 2019	1.000	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Future Concepts and Planning - Future Concepts - FFRDC / UARC 1	MIPR	SNL : CA	3.486	0.406	Nov 2019	0.415	Nov 2020	0.212	Nov 2021	-		0.212	Continuing	Continuing	Continuing
Future Concepts and Planning - Future	MIPR	MIT/LL : MA	4.699	0.406	Nov 2019	0.415	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD24 / *System Engineering & Integration*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Concepts - FFRDC / UARC 3															
Future Concepts and Planning - Future Concepts - FFRDC / UARC 5	MIPR	MITRE : VA	4.101	0.488	Nov 2019	0.498	Nov 2020	0.423	Nov 2021	-		0.423	Continuing	Continuing	Continuing
Future Concepts and Planning - Future Concepts - FFRDC / UARC 6	MIPR	Aerospace : CA	5.032	0.406	Nov 2019	0.415	Nov 2020	0.423	Nov 2021	-		0.423	Continuing	Continuing	Continuing
Future Concepts and Planning - Future Concepts - Support	Allot	MDA : VA / AL	20.195	6.106	Oct 2019	5.902	Oct 2020	6.080	Oct 2021	-		6.080	Continuing	Continuing	Continuing
Future Concepts and Planning - Previous Year Future Concepts - No Longer in FYDP	Various	Various : Various	82.988	0.000		0.000		0.000		-		0.000	0.000	82.988	0.000
System Engineering, Engineering Analysis and Quick Response Team - Previous Year Sys Engrg, QRT - No Longer In FYDP	Various	Various : Various	6.253	0.000		0.000		0.000		-		0.000	0.000	6.253	0.000
System Engineering, Engineering Analysis and Quick Response Team - Sys Engrg, QRT - CSS	C/CPFF	TEAMS : AL	40.420	2.003	Nov 2019	2.680	Nov 2020	2.485	Nov 2021	-		2.485	Continuing	Continuing	Continuing
System Engineering, Engineering Analysis and Quick Response Team - Sys Engrg, QRT - CSS 2	C/CPFF	SAIC : VA, AL	31.623	7.421	Nov 2019	7.956	Nov 2020	8.115	Nov 2021	-		8.115	Continuing	Continuing	Continuing
System Engineering, Engineering Analysis and Quick Response Team - Sys Engrg, QRT - Industry Spt	C/CPFF	Boeing : VA, AL	0.492	0.592	Nov 2019	0.664	Nov 2020	0.461	Nov 2021	-		0.461	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD24 / *System Engineering & Integration*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Discrimination - Discrimination - CSS	C/CPFF	TEAMS : AL	23.345	6.103	Nov 2019	5.771	Nov 2020	5.635	Nov 2021	-		5.635	Continuing	Continuing	Continuing
Discrimination - Discrimination - Industry	C/CPAF	Boeing : AL, VA	48.302	13.777	Nov 2019	11.906	Nov 2020	12.971	Nov 2021	-		12.971	Continuing	Continuing	Continuing
Discrimination - Discrimination - Support	Allot	MDA : AL, VA	32.735	1.836	Oct 2019	5.876	Oct 2020	1.856	Oct 2021	-		1.856	Continuing	Continuing	Continuing
Discrimination - Prior Year Discrimination Improvements no longer funded in FYDP	Various	Various : Various	61.423	0.000		0.000		0.000		-		0.000	0.000	61.423	0.000
Risk Management - Risk Mgt - Analysis	Various	MDA : VA, AL	32.032	7.164	Oct 2019	6.929	Oct 2020	7.042	Oct 2021	-		7.042	Continuing	Continuing	Continuing
Risk Management - Risk Mgt - Analysis Spt	C/CPAF	TEAMS : AL	3.972	0.302	Nov 2019	0.268	Nov 2020	0.273	Nov 2021	-		0.273	Continuing	Continuing	Continuing
Risk Management - Risk Mgt - FFRDC/UARC	MIPR	MITRE : VA	6.412	0.610	Nov 2019	0.623	Nov 2020	0.586	Nov 2021	-		0.586	Continuing	Continuing	Continuing
Risk Management - Risk Mgt - ICT	C/CPAF	Northrop Grumman : AL, AK, CA, CO, HI, NM, VA	2.125	0.000		0.000		0.000		-		0.000	0.000	2.125	0.000
Anti-Tamper & Engineering Manufacturing Readiness Level Development - AT & EMRL - Anti-Tamper	Various	Various : AL, VA, CO	1.048	0.881	Dec 2019	0.237	Dec 2020	0.190	Dec 2021	-		0.190	Continuing	Continuing	Continuing
Anti-Tamper & Engineering Manufacturing Readiness Level Development - AT & EMRL - Anti-Tamper OGA Support	MIPR	CCDC : AL	0.000	0.261	Dec 2019	0.264	Nov 2020	0.269	Nov 2021	-		0.269	Continuing	Continuing	Continuing
Anti-Tamper & Engineering Manufacturing Readiness Level Development - AT & EMRL - Anti-Tamper Support	MIPR	NSWC Crane : IN	7.211	0.256	Dec 2019	0.264	Nov 2020	0.269	Nov 2021	-		0.269	Continuing	Continuing	Continuing
Anti-Tamper & Engineering Manufacturing Readiness	Allot	MDA : AL, VA	30.488	3.451	Nov 2019	4.504	Oct 2020	4.639	Oct 2021	-		4.639	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD24 / *System Engineering & Integration*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Level Development - AT & EMRL - MDA															
Anti-Tamper & Engineering Manufacturing Readiness Level Development - Prior Year AT & EMRL no longer funded in FYDP	Various	Various : Various	2.983	0.000		0.000		0.000		-		0.000	0.000	2.983	0.000
Manufacturing and Producibility - Core Standards	C/CPFF	Boeing : AL	6.024	1.653	Nov 2019	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Manufacturing and Producibility - Mfg and Producibility	Allot	MDA : AL	5.619	0.819	Nov 2019	3.152	Oct 2020	3.247	Oct 2021	-		3.247	Continuing	Continuing	Continuing
Manufacturing and Producibility - Mfg and Producibility - CSS	C/CPFF	TEAMS : AL, VA	1.503	0.944	Nov 2019	0.967	Nov 2020	1.095	Nov 2021	-		1.095	Continuing	Continuing	Continuing
Manufacturing and Producibility - Mfg and Producibility - OGA Support	MIPR	CCDC : AL	11.162	1.716	Nov 2019	0.645	Nov 2020	0.538	Nov 2021	-		0.538	Continuing	Continuing	Continuing
Manufacturing and Producibility - Mfg and Producibility - Various	Various	Various : AL	1.889	0.000		0.150	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Manufacturing and Producibility - Previous Year Mfg and Producibility - No Longer In FYDP	Various	Various : Various	1.450	0.000		0.000		0.000		-		0.000	0.000	1.450	0.000
JEON Capability - CSS	C/CPFF	TEAMS : VA, AL	3.565	0.920	Dec 2019	1.340	Nov 2020	0.000		-		0.000	0.000	5.825	0.000
JEON Capability - FFRDC/ UARC	MIPR	MITRE : VA	0.934	0.407	Dec 2019	0.415	Nov 2020	0.000		-		0.000	0.000	1.756	0.000
JEON Capability - Framework, Truth Models	Various	Various : CO, AL	2.367	1.391	Dec 2019	0.622	Nov 2020	0.000		-		0.000	0.000	4.380	0.000
JEON Capability - Industry Support	C/CPFF	Boeing : AL, VA	2.106	0.000		0.000		0.000		-		0.000	0.000	2.106	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD24 / *System Engineering & Integration*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JEON Capability - Industry Support - IRES	C/CPAF	Northrop Grumman : AL, VA	4.808	2.335	Dec 2019	1.818	Nov 2020	0.000		-		0.000	0.000	8.961	0.000
JEON Capability - OGA	MIPR	CCDC : AL	3.036	1.232	Dec 2019	1.443	Nov 2020	0.000		-		0.000	0.000	5.711	0.000
JEON Capability - Systems Engineering	Various	MDA Various : VA, AL, CO	3.450	1.979	Dec 2019	1.025	Nov 2020	0.000		-		0.000	0.000	6.454	0.000
JEON Capability - Test & Performance Analysis	Various	Various : VA, AL	4.058	4.210	Dec 2019	3.200	Nov 2020	0.000		-		0.000	0.000	11.468	0.000
JEON Capability - UARC	MIPR	JHU / APL : MD, VA	3.974	0.675	Dec 2019	0.816	Nov 2020	0.000		-		0.000	0.000	5.465	0.000
		Subtotal	1,205.752	168.022		174.753		167.118		-		167.118	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,205.752	168.022		174.753		167.118		-		167.118	Continuing	Continuing	N/A

Remarks

Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.

Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD24 / *System Engineering & Integration*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
Update to BMD SDD - FY 2020	▲																											
Technical Objectives & Goals / Effectiveness Metrics Standard Updates - FY 2020		▲																										
SEP Update - FY 2020		▲																										
BMD SS - FY 2020		▲																										
Update Achievable Capabilities List - FY 2020		▲																										
BMDS Engineering Review - FY 2020			▲																									
Update to IMAP - 3Q FY 2020			▲																									
Update MIP - FY 2020				▲																								
SS - FY 2021							▲																					
MDS Engineering Review - FY 2021							△																					
Update MIP - FY 2021							△																					
Update to SDD - FY 2021								△																				
Update to IMAP - FY 2021								△																				
E/CCA - 4Q FY 2021								△																				
Update MIP - FY 2022									△																			
Update to SDD - FY 2022										△																		
Updates to IMAP -FY 2022										△																		
SEP Update FY 2022										△																		
Update Achievable Capabilities List - FY 2022										△																		
SS - FY 2022										△																		
MDS Engineering Review - FY 2022											△																	
E/CCA - 4Q FY 2022												△																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD24 / *System Engineering & Integration*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Update to BMD SDD - FY 2020	1	2020	1	2020
Technical Objectives & Goals / Effectiveness Metrics Standard Updates - FY 2020	2	2020	2	2020
SEP Update - FY 2020	2	2020	2	2020
BMD SS - FY 2020	2	2020	2	2020
Update Achievable Capabilities List - FY 2020	2	2020	2	2020
BMDS Engineering Review - FY 2020	3	2020	3	2020
Update to IMAP - 3Q FY 2020	3	2020	3	2020
Update MIP - FY 2020	4	2020	4	2020
SS - FY 2021	3	2021	3	2021
MDS Engineering Review - FY 2021	3	2021	3	2021
Update MIP - FY 2021	3	2021	3	2021
Update to SDD - FY 2021	4	2021	4	2021
Update to IMAP - FY 2021	4	2021	4	2021
E/CCA - 4Q FY 2021	4	2021	4	2021
Update MIP - FY 2022	1	2022	1	2022
Update to SDD - FY 2022	2	2022	2	2022
Updates to IMAP -FY 2022	2	2022	2	2022
SEP Update FY 2022	2	2022	2	2022
Update Achievable Capabilities List - FY 2022	2	2022	2	2022
SS - FY 2022	2	2022	2	2022
MDS Engineering Review - FY 2022	3	2022	3	2022
E/CCA - 4Q FY 2022	4	2022	4	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD24 / *System Engineering & Integration*

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD21 / *Homeland Cruise Missile Defense Architecture*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD21: *Homeland Cruise Missile Defense Architecture*	-	0.000	3.000	13.921	-	13.921	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Increase from FY 2021 to FY 2022 provides for Cruise Missile Defense of the Homeland architecture design and fire control demonstration, in response to USNORTHCOM requirements.

A. Mission Description and Budget Item Justification

In response to USNORTHCOM's requirements for Cruise Missile Defense of the Homeland (CMD-H), the Missile Defense Agency (MDA) will develop systems architecture and conduct a Joint Tactical Integrated Fire Control (JTIFC) demonstration. The effort includes developing systems engineering requirements, software modifications, models and simulations, and integration of joint sensors and shooters into a fire control network for the demonstration of cruise missile defense capability.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Homeland Cruise Missile Defense Architecture	0.000	3.000	13.921
Articles:	-	-	-
Description: Perform architecture and systems engineering activities required to evolve Cruise Missile Defense of the Homeland, to include architecture analysis, capability roadmap development, and initial requirements analysis. An initial Joint Tactical Integrated Fire Control (JTIFC) demonstration is planned.			
FY 2021 Plans: - Conduct system architecture and engineering analysis to integrate Sensors, Command & Control, Battle Management and Engagement systems for Cruise Missile Defense.			
FY 2022 Plans: - Conduct architecture definition and systems engineering, including system requirements analysis and modeling and simulation -- Conduct the engineering and design of a JTIFC demonstration to integrate Joint sensors and weapons into an integrated fire control network -- Obtain hardware critical to capability demonstration, including Integrated Air and Missile Defense (IAMD) Battle Command System (IBCS) radios and dismounted Engagement Operations Center (EOC), and Cooperative Engagement Capability (CEC) hardware -- Build software adaptive layers for sensors and weapons to integrate into composite tracking / integrated fire control networks			
FY 2021 to FY 2022 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD21 / *Homeland Cruise Missile Defense Architecture*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Increase from FY 2021 to FY 2022 provides for architecture design, requirements analysis, design, and modeling to support Cruise Missile Defense development efforts building to a fire control demonstration, in response to USNORTHCOM requirements.			
Accomplishments/Planned Programs Subtotals	0.000	3.000	13.921

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

MDA leverages the nation's engineering Centers of Excellence at government agencies and Military Services, FFRDCs, UARCs, and industry. The executing agents utilize various contracting strategies in a flexible manner to maximize their contribution. Products and Services will be acquired by competitive means to the extent that is possible and practical.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD21 / *Homeland Cruise Missile Defense Architecture*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Homeland Cruise Missile Defense Architecture - CMD-H Architecture Design	Various	Various : VA, MD, MA, CO	0.000	0.000		3.000	Jan 2021	3.521	Dec 2021	-		3.521	Continuing	Continuing	Continuing
Homeland Cruise Missile Defense Architecture - CMD-H Demonstration (Prime-1)	C/CPFF	Raytheon : MD, FL, CA, MA	0.000	0.000		0.000		7.800	Dec 2021	-		7.800	Continuing	Continuing	Continuing
Homeland Cruise Missile Defense Architecture - CMD-H Demonstration (Prime-2)	C/CPFF	Numerica : CO	0.000	0.000		0.000		1.000	Dec 2021	-		1.000	Continuing	Continuing	Continuing
Homeland Cruise Missile Defense Architecture - CMD-H Demonstration (Prime-3)	C/CPFF	Northrop Grumman : AL	0.000	0.000		0.000		0.400	Dec 2021	-		0.400	Continuing	Continuing	Continuing
Homeland Cruise Missile Defense Architecture - CMD-H Demonstration (Prime-4)	C/CPFF	Leidos : VA	0.000	0.000		0.000		1.200	Dec 2021	-		1.200	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		3.000		13.921		-		13.921	Continuing	Continuing	N/A

Remarks

Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		3.000		13.921		-		13.921	Continuing	Continuing	N/A

Remarks

N/A

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD21 / *Homeland Cruise Missile Defense Architecture*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
IFC CMD-H Demonstration						✧	✧	✧	✧	✧	✧	✧																
CMD-H Increment 1 System Architecture									✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD21 / *Homeland Cruise Missile Defense Architecture*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
IFC CMD-H Demonstration	2	2021	4	2022
CMD-H Increment 1 System Architecture	1	2022	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MT23 / *Enabling - Test*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MT23: *Enabling - Test*	112.912	58.143	49.293	41.576	-	41.576	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2021 to FY 2022 is in accordance with the current Integrated Master Test Plan (IMTP).

A. Mission Description and Budget Item Justification

The Enabling Test project includes the System Engineering & Integration (SE&I) that drives Missile Defense System (MDS) test planning, execution, and post-test analysis and assessment, and the Modeling & Simulation (M&S) tools and framework required to prepare for and execute ground and flight tests.

SE&I allocates test requirements to individual test events, designs test architectures, defines target requirements, and generates ground and flight test scenarios to collect data essential for model validation and system verification. SE&I works with the Service Operational Test Agencies (OTA) to incorporate operational test requirements into MDS events to ensure the incremental capability being transferred to the Warfighter will be operationally effective, suitable, and survivable. The resulting data ensures MDS requirements are being met by the system under test and confirms proper BMD System operation. It also helps to anchor system and element M&S for use in simulations to characterize System performance across the battle space, including areas where no live-fire-testing is performed.

Engineering ground test (GT) responsibilities include System performance sensitivity analysis; scenario design and optimization; analysis to mitigate test data collection risks; test architecture certification analysis; and test result analysis. Flight test (FT) responsibilities include pre-mission scenario analysis to identify and mitigate test execution risk in advance; range safety analysis; mission analysis during test execution; extensive post-mission analysis; and event analysis reporting products. These efforts inform senior leaders' decisions on MDS development and evolution and underpin the capability declarations that deliver new capabilities to the Warfighter.

Pre-mission predictions use the test framework and Hardware in the Loop (HWIL) and digital models of the test configuration to exercise system interfaces, calculate expected System performance, and gauge readiness for test execution. Post-mission, MDA uses test results to anchor System and element M&S and provide confidence in their ability to correctly predict System behavior and performance.

Reliability, Availability and Maintainability data collected through MDS test events increases confidence in System performance over the entire lifecycle. SE&I documents any abnormal System behavior observed during tests and alerts MDA to issues with test article reliability. SE&I leads test failure review boards, identifies data collection shortfalls, and reallocates objectives to future test events as needed until all required model validation data is collected. The Failure Reporting, Analysis, and Corrective Action System provides a framework to investigate test failures and anomalies and identify solutions that will ultimately improve System performance and reliability.

MDA's M&S systems and products provide the Agency, the Warfighter, and the OTA with the capability to evaluate individual System components and the overall system-of-systems. MDA validates and accredits System-level models and simulations to support accurate and comprehensive assessments. M&S System and product testing follows the test program outlined in MDA's IMTP and serves as a necessary precursor to conducting System-level testing. Resources for the planning, design, execution and management of this testing are provided in accordance with the most current version of the IMTP.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MT23 / *Enabling - Test*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Engineering and Analysis	35.243	31.725	24.569
Articles:	-	-	-

Description: The Engineering and Analysis effort provides essential System ground and flight test event planning, execution, and evaluation activities for each test event:
- Design test architecture, define test objectives and evaluation criteria, define target requirements, and generate ground and flight test scenarios appropriate to the data collection requirements to assess System performance and anchor Models and Simulations (M&S)
- Produce threat data for System ground and flight tests
- Coordinate with BMDS Operational Test Agency (OTA) to address test issues, disposition them, coordinate them, and recommend action plans to achieve closure
- Deliver M&S integration test cases
- Conduct M&S Integration Benchmarking and integrate the MDS M&S framework with MDA and non-MDA Elements into the event architectures that support assessment activities
- Integrate, test, and deliver end-to-end System-level simulations supporting ground test missions
- Deploy and maintain M&S Simulation Interface Units (SIUs) for testing, including cybersecurity compliance, configuration management authority, and sustainment of the SIU fleet
- Analyze System-level interoperability
- Conduct modeling and technical analysis for Combatant Command wargames and exercises
- Utilize M&S for pre-test assessment, post-test review, and M&S updates
- Provide test configuration management; risk assessments; and anomaly/deficiency review, assessment and closure
- Analyze test results to identify verification and validation data collection shortfalls and reassign objectives to future test events as required
- Perform event architecture certification
- Provide Federation reporting for VV&A of M&S architectures
- Document test observations for System-level test anomalies and coordinate the resulting Discrepancy Reports within the Failure Reporting, Analysis, and Corrective Action System (FRACAS)
- Upgrade test analysis tools in concert with the MDS evolution (e.g., Modular Analysis and Reporting Suite (MARS)) to enhance analysis capability and efficiency

Specific and/or unique accomplishments to each FY are as follows:

FY 2021 Plans:
- SEE ABOVE.

FY 2022 Plans:

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MT23 / *Enabling - Test*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 is in accordance with the current IMTP.			
Title: Continuous Integration and Agile Test (CI/CAT) ***Articles:*** ***Description:*** Provide test planning, analysis, M&S integration, M&S execution, threat development, and post-event analysis for integrated ground testing, M&S Continuous Developmental Integration, and M&S engineering activities. Execute agency ground test plan in accordance with approved IMTP and maintain integration across concurrent ground test and flight test activities Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A	13.599 -	11.263 -	11.323 -
Title: Continuous Development & Integration (CDI) Environment ***Articles:*** ***Description:*** Provide M&S integration technical expertise and risk reduction process for MDS Element integration activities and event planning within a Continuous Development and Integration (CDI) environment, to include support to IMTP testing and M&S engineering activities; a venue for integrating new Elements, interfaces, connectivity and functionality to support MDS capability increment upgrades; and cybersecurity monitoring and automation to the CDI environment. It also supports Element modeling capabilities for advance concept analysis in CDI architectures. This is a critical enabler to achieve the Ground Test Concept of Operations. Conduct Early Integration activities such as scenario refinement and early checkout of Element software for Ground Test sprints. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:***	9.301 -	6.305 -	5.684 -

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MT23 / *Enabling - Test*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	58.143	49.293	41.576

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603914C: *Ballistic Missile Defense Test*	398.939	365.208	362.906	-	362.906	-	-	-	-	-	-
• 0604878C: *Aegis BMD Test*	167.364	71.498	117.055	-	117.055	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

In order to optimize System performance, MDA leverages the nation's engineering Centers of Excellence at government agencies and Military Services, FFRDCs, UARCs, and industry. The executing agents utilize various contracting strategies in a flexible manner to maximize their contribution. MDA will acquire products and services by competitive means to the extent practical.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MT23 / *Enabling - Test*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering and Analysis - Engineering & Analysis - CSS Support	C/CPFF	TEAMS : AL	6.745	5.131	Nov 2019	5.229	Nov 2020	3.773	Nov 2021	-		3.773	Continuing	Continuing	Continuing
Engineering and Analysis - Engineering & Analysis - FFRDC	MIPR	Aerospace : AL	1.426	0.406	Nov 2019	0.415	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Engineering and Analysis - Engineering & Analysis - Industry	C/CPAF	Boeing : VA, AL	19.008	7.201	Nov 2019	7.314	Nov 2020	3.926	Nov 2021	-		3.926	Continuing	Continuing	Continuing
Engineering and Analysis - Engineering & Analysis - Integration Support CSS	C/CPAF	COLSA : AL, CO	21.744	0.000		0.000		0.000		-		0.000	0.000	21.744	0.000
Engineering and Analysis - Engineering & Analysis - Non-MDA Element Support for IMTP Events	Various	Various : AL, CO	1.838	7.111	Nov 2019	3.651	Nov 2020	2.137	Nov 2021	-		2.137	Continuing	Continuing	Continuing
Engineering and Analysis - Engineering & Analysis - OGA Support	MIPR	CCDC : AL	45.118	14.856	Nov 2019	14.567	Nov 2020	13.753	Nov 2021	-		13.753	Continuing	Continuing	Continuing
Engineering and Analysis - Engineering & Analysis - OGA Support - NME	MIPR	LTPO : AL	4.287	0.000		0.000		0.000		-		0.000	0.000	4.287	0.000
Engineering and Analysis - Engineering & Analysis - Technical Support	C/CPAF	Northrop Grumman : VA, AL	5.554	0.000		0.000		0.000		-		0.000	0.000	5.554	0.000
Engineering and Analysis - Engineering & Analysis - Test Engineering Support	Various	Various : AL, CO, VA	3.541	0.538	Nov 2019	0.549	Nov 2020	0.980	Nov 2021	-		0.980	Continuing	Continuing	Continuing
Continuous Integration and Agile Test (CI/CAT) - CI/CAT Analysis (OGA)	MIPR	CCDC : AL	0.000	0.000		0.000		2.990	Dec 2021	-		2.990	Continuing	Continuing	Continuing
Continuous Integration and Agile Test (CI/CAT) - CI/CAT M&S Integration	Various	Various : AL, CO	0.000	7.979	Dec 2019	6.113	Dec 2020	5.708	Dec 2021	-		5.708	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MT23 / *Enabling - Test*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Continuous Integration and Agile Test (CI/CAT) - CI/ CAT Test & Performance Analysis	Various	Various : AL, CO	0.000	4.567	Dec 2019	4.076	Dec 2020	0.000		-		0.000	0.000	8.643	0.000
Continuous Integration and Agile Test (CI/CAT) - CI/ CAT Test Requirements Engineering	C/CPFF	TEAMS : AL, CO	0.000	1.053	Nov 2019	1.074	Nov 2020	2.625	Nov 2021	-		2.625	Continuing	Continuing	Continuing
Continuous Integration and Agile Test (CI/CAT) - CSS	Various	Various : Various	1.962	0.000		0.000		0.000		-		0.000	0.000	1.962	0.000
Continuous Integration and Agile Test (CI/CAT) - Hardware	C/CPFF	TBE : AL	1.689	0.000		0.000		0.000		-		0.000	0.000	1.689	0.000
Continuous Development & Integration (CDI) Environment - Continuous Development and Integration Environment	MIPR	CCDC : AL, CO	0.000	9.301	Dec 2019	6.305	Dec 2020	5.684	Dec 2021	-		5.684	Continuing	Continuing	Continuing
		Subtotal	112.912	58.143		49.293		41.576		-		41.576	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	112.912	58.143		49.293		41.576		-		41.576	Continuing	Continuing	N/A

Remarks

Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MT23 / *Enabling - Test*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
IMTP Engineering Inputs - 1Q - FY 2020	▲																											
IMTP Engineering Inputs - 3Q - FY 2020			▲																									
IMTP Engineering Inputs - 1Q - FY 2021					▲																							
GTI-09 Sprint 1 (E/C) (MDS Ground Test)									✧																			
IMTP Engineering Inputs - 3Q - FY 2021							△																					
GTI-09 Sprint 2 (E/C) (MDS Ground Test)										✧	✧																	
IMTP Engineering Inputs - 1Q - FY 2022									△																			
IMTP Engineering Inputs - 3Q - FY 2022											△																	

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MT23 / *Enabling - Test*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
IMTP Engineering Inputs - 1Q - FY 2020	1	2020	1	2020
IMTP Engineering Inputs - 3Q - FY 2020	3	2020	3	2020
IMTP Engineering Inputs - 1Q - FY 2021	1	2021	1	2021
GTI-09 Sprint 1 (E/C) (MDS Ground Test)	1	2022	1	2022
IMTP Engineering Inputs - 3Q - FY 2021	3	2021	3	2021
GTI-09 Sprint 2 (E/C) (MDS Ground Test)	2	2022	3	2022
IMTP Engineering Inputs - 1Q - FY 2022	1	2022	1	2022
IMTP Engineering Inputs - 3Q - FY 2022	3	2022	3	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD28 / *Intelligence & Security*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD28: *Intelligence & Security*	279.811	42.554	42.501	39.550	-	39.550	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

The Intelligence and Security program provides multi-disciplinary intelligence and security for the Missile Defense System (MDS) acquisition, development, test and deployment. The Intelligence and Security Major Program Goals are:
-- Ensure the Intelligence Community (IC) understands and fulfills MDA's current and future prioritized intelligence requirements; advocate Missile Defense test intelligence requirements; and work closely with the IC.
-- Leverage available National and DoD Counterintelligence resources. Ensure counterintelligence products and services are fully integrated into all RDT&E programs and activities to protect classified information and critical technologies and to protect Missile Defense Agency (MDA) and MDS personnel, facilities, information and activities.
-- Define cybersecurity systems engineering requirements for MDS assets. Identify cybersecurity systems engineering and infrastructure intelligence requirements to focus IC collection, analysis and production to target MDA/MDS cyber vulnerabilities. Incorporate cybersecurity engineering requirements into the MDS systems engineering process.
-- Provide cross-Agency acquisition security oversight and support for the identification and protection of Critical Program Information (CPI), and evaluation and implementation of developing Supply Chain Risk Management (SCRM) requirements. Provide physical security for MDS weapons/sensor system deployments, including Foreign Military Sales (FMS). Implement MDA's information security and declassification programs. Strengthen Test and Operations Security (OPSEC) across the Agency.

The Security and Intelligence Project captures five specific areas: 1) Intelligence 2) Counterintelligence 3) Cybersecurity Engineering 4) Program Protection, and 5) Threat Systems Engineering. Collectively, these efforts provide critical information regarding threat ballistic missile system capabilities; protection of personnel, activities, and technology from espionage and terrorism; and identification and mitigation of MDS system vulnerabilities.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Intelligence	10.527	8.771	7.983
Articles:	-	-	-
Description: The Intelligence program provides expertise to develop intelligence products on threat system capabilities, and leverages unique intelligence-community developed, owned, and operated capabilities for the benefit and advocacy of the missile defense community. Program goals include: - Serve as designated intelligence liaison between MDA and the Intelligence Community			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD28 / *Intelligence & Security*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-- Maintain and communicate prioritized, specific Missile Defense intelligence requirements to the Intelligence Community -- Maintain a focused dialogue with members of the Intelligence Community to ensure understanding, urgency and context of MDA intelligence requirements - Provide Current, Technical, Acquisition, Collection and Cyber intelligence to the MDS throughout the acquisition life cycle - Maintain and update MDA's knowledge base of foreign ballistic missile threats, including development, enhancement, and population of the Missile Threat Portals with Intelligence Community produced documents at the appropriate security classification levels - Characterize all missile threat systems from adversaries for use by the MDA Systems Engineer, Program Managers, and Director for Test to perform modeling, simulation, and testing of the MDS - Maintain Missile Intelligence Secure Link (MISL) classified portal (full operational capability) Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Counterintelligence	8.616	7.496	6.936
Articles:	-	-	-
Description: The Counterintelligence Program detects, mitigates or neutralizes espionage, foreign intelligence collection activities and terrorist activities conducted for or on behalf of foreign powers, organizations, persons, or their agents directed against U.S. national security interests, or DoD/MDA and its personnel, information, material, facilities, and activities. Program goals include: - Serve as MDA Liaison with Federal, State and Local Law Enforcement and Counterintelligence (CI) Organizations to report and resolve incidents involving MDA personnel, information and technologies -- Engage National, Combatant Command and DoD CI resources to share and obtain threat information impacting MDA personnel, facilities, information, technologies, programs and activities, worldwide -- Provide CI, technical and cyber threat support to MDA flight tests, conferences, and deployment activities worldwide, including FMS Programs, to detect, deter, or neutralize criminal, terrorist and foreign intelligence collection threats targeting MDA and Missile Defense technologies, personnel, facilities and activities			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD28 / *Intelligence & Security*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Execute life cycle replacement of outdated technical surveillance countermeasures and cyber forensics gear to employ the latest technologies during conferences, flight tests and other classified activities to detect, deter and prevent the loss or compromise of classified or sensitive information to foreign adversary collection activities - Conduct CI in Cyberspace activities to detect malicious and insider threat activities targeting MDA administrative and fire control networks - Conduct MDA Insider Threat Program to identify, deter and mitigate potential insider threats - Provide required CI Awareness and Reporting training to MDA workforce - Provide CI research and assistance for cyber forensics and analysis to identify insider and foreign entity cyber threats to MDA computer networks and Missile Defense fire control systems - Conduct CI research and analysis to produce CI threat products that address foreign intelligence, cyber and international terrorist threats to MDA personnel, facilities, information, systems and activities worldwide - Maintain technical surveillance countermeasures and cyber forensic gear to detect, identify and neutralize adversary collection platforms and capabilities used to gain unauthorized access to MDA classified and controlled unclassified information Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Cybersecurity Engineering Program	3.596	4.826	4.255
Articles:	-	-	-
Description: Cybersecurity Engineering is focused on developing designs and solutions to protect the MDS from existing and emerging cyber threats through coherent cybersecurity systems engineering. Program goals include: - Ensure Cybersecurity is integrated into the Acquisition Process - Assess the Cybersecurity Architecture to address gaps/disconnects, enhance interoperability, and realize efficiencies across all mission systems; define the "As Built" and "To Be" Cybersecurity Systems Engineering concepts to strengthen technical assessments and cybersecurity design solutions and implementation recommendations impacted by the change in requirements -- Develop and coordinate near-term and long-term engineering changes to the MDS -- Develop requirements for building cybersecurity into incremental MDS hardware and software builds -- Monitor allocation of these requirements to the Elements			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD28 / *Intelligence & Security*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-- Recommend updates to MDA's Technical Core Standards, including Cyber-related requirements specified by the Agency, the Combatant Commanders (CCMDs), the DoD, and the Federal Government -- Perform cybersecurity systems engineering assessments for proposed System Specification and interface changes and additions - Provide and recommend updates to cybersecurity systems engineering policy and guidance for MDS design and acquisition to enhance resiliency against cyber threats - Implement cybersecurity engineering resiliency techniques - Provide objectives and requirements for Cybersecurity testing - Provide independent cybersecurity reviews at critical engineering milestones - Provide information system security engineering by assessing cybersecurity requirements, design, and implementations and provide recommendations to address architecture gaps or shortfalls - Implement cyber threat mitigation strategies within MDS architecture, design, system requirements, and specifications documentation to ensure traceability to necessary components and interfaces that make up the Missile Defense System - Coordinate evaluation of cybersecurity capability during System tests - Develop verification and assessment strategies for System cybersecurity requirements Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Program Protection	11.032	10.929	10.112
Articles:	-	-	-
Description: Protects Missile Defense information, Critical Program Information, technologies, and deploying systems; develops and coordinates Security Classification Guides; and performs declassification reviews to identify equities that warrant continued protection in order to preserve the technological advantage of the MDS. Program Protection also coordinates MDA intelligence, counterintelligence and security for MDS test activities. Program goals include: - Perform reviews required for all Agency public release, security classification, and Freedom of Information Act (FOIA) and Mandatory Declassification Reviews to ensure sensitive Missile Defense information is not inadvertently released into the public domain			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD28 / *Intelligence & Security*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Perform Information Security program management and oversee implementation by MDA programs -- Perform internal program reviews, policy oversight and implementation, and training to identify and fix deficiencies and protect critical information -- Collect information required for annual reports and communicate security posture to leadership - Provide security oversight for the Agency's classified contracts by drafting and coordinating DD254 "Contract Security Classification Specification" documents - Execute an effective SCRM program to prevent unmitigated risks from degrading the performance of components and systems across the supply chain - Provide dedicated on-site security and protection of Missile Defense resources and personnel at operational sites in Alaska, California and Colorado to ensure security protection coverage of MDS mission operations and test assets based in those regions - Perform systematic Declassification reviews on historical Agency information to prevent unauthorized disclosures due to automatic declassification requirements - Identify and integrate Security requirements for overseas sites with existing or planned missile defense weapons or sensor systems to ensure protection of deployed sites - Provide effective physical protection to low density/high demand emerging Warfighter capability - Expand security activities - Conduct program protection planning for the continuing assessment of candidate critical program information for Advanced Technology programs and reassessment of other MDA programs affected by technical baseline changes; ensure critical technologies embedded in missile defense systems are not vulnerable to compromise - Keep pace with mission growth in program protection, system security engineering, acquisition security, and SCRM Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Threat Systems Engineering	8.783	10.479	10.264
Articles:	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD28 / *Intelligence & Security*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Description: Threat Engineering provides representations of adversary missile capabilities based on available intelligence information, and develops, coordinates, and baselines MDS-level targets and countermeasures requirements to define target capabilities required to meet System flight test objectives. Program goals include: - Develop threat definitions for system specifications -- Produce threat / scenario data for MDS development events -- Perform Threat Verification and Validation analysis to verify missile models meet specifications and are consistent with intelligence assessments - Produce Adversary Data Package (ADP) updates - Develop target requirements to ensure flight test targets meet operationally realistic conditions - Produce Target Assessment and Certification Reports - Assess threat representation of flight test targets - Develop target system specifications and guide targets requirements development, planning, and certification for MDS flight tests - Analyze flight test target performance relative to threat intelligence assessments to support target system verification and certification - Provide Technical Data for major reviews (System Requirements Reviews, Critical Design Reviews, etc.) - Complete Target Specification builds - Update MDA INS 5000.06, Target Class Capabilities and Requirements documents as necessary Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	42.554	42.501	39.550

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0305103C: *Cyber Security Initiative*	11.109	1.148	1.142	-	1.142	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD28 / *Intelligence & Security*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

This project leverages expertise in the intelligence community, counterintelligence community, and information assurance community, including the Military Services, Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Centers (UARCs), and industry. The executing agents utilize various contracting strategies in a flexible manner to maximize their contribution. Products and Services will be acquired by competitive means to the extent that is beneficial and practical.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD28 / *Intelligence & Security*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Intelligence - Intelligence Analysis & Support	Allot	MDA : VA, AL, CO	29.752	3.993	Oct 2019	3.903	Oct 2020	3.555	Oct 2021	-		3.555	Continuing	Continuing	Continuing
Intelligence - Intelligence Support	C/CPFF	TEAMS : AL, VA, CO	30.369	6.220	Nov 2019	4.289	Nov 2020	4.428	Nov 2021	-		4.428	Continuing	Continuing	Continuing
Intelligence - Intelligence Support - IT Maintenance	C/CPFF	Northrop Grumman : AL, CO	2.613	0.314	Nov 2019	0.579	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Intelligence - Prior year Intelligence Support no longer funded in FYDP	Various	Various : Various	7.770	0.000		0.000		0.000		-		0.000	0.000	7.770	0.000
Counterintelligence - CI Analysis & Support	Allot	MDA : AL, CO, VA	14.196	3.446	Oct 2019	2.852	Oct 2020	2.598	Oct 2021	-		2.598	Continuing	Continuing	Continuing
Counterintelligence - CI Analysis and Support	C/CPFF	TEAMS : AL, CO, VA	23.526	4.746	Nov 2019	4.211	Nov 2020	3.897	Nov 2021	-		3.897	Continuing	Continuing	Continuing
Counterintelligence - CI Surveillance Gear	Various	Various : Various	1.060	0.424	Dec 2019	0.433	Dec 2020	0.441	Dec 2021	-		0.441	Continuing	Continuing	Continuing
Counterintelligence - Prior Year Counterintelligence Support no longer funded in FYDP	C/CPFF	MIDAESS : VA	1.069	0.000		0.000		0.000		-		0.000	0.000	1.069	0.000
Cybersecurity Engineering Program - Cybersecurity - FFRDC	FFRDC	Aerospace : CA, VA	3.663	0.000		0.000		0.000		-		0.000	0.000	3.663	0.000
Cybersecurity Engineering Program - Cybersecurity - FFRDC (2)	FFRDC	MITRE : VA, AL	3.858	0.000		0.000		0.000		-		0.000	0.000	3.858	0.000
Cybersecurity Engineering Program - Cybersecurity Engineering	Allot	MDA : VA, AL	16.243	1.549	Oct 2019	2.103	Oct 2020	1.429	Oct 2021	-		1.429	Continuing	Continuing	Continuing
Cybersecurity Engineering Program - Cybersecurity Engineering - Hardware	Various	Various : AL, CO, VA	0.000	1.107	Nov 2019	0.923	Nov 2020	0.588	Nov 2021	-		0.588	Continuing	Continuing	Continuing
Cybersecurity Engineering Program - Cybersecurity Engineering CSS	C/CPFF	TEAMS : VA, AL	4.363	0.940	Nov 2019	1.800	Nov 2020	2.238	Nov 2021	-		2.238	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD28 / *Intelligence & Security*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Protection - Declassification Analysis	C/CPFF	TEAMS : VA, AL	9.773	2.096	Nov 2019	2.436	Nov 2020	2.202	Nov 2021	-		2.202	Continuing	Continuing	Continuing
Program Protection - Program Protection Analysis	Allot	MDA : VA, AL	29.552	3.733	Oct 2019	4.956	Oct 2020	4.514	Oct 2021	-		4.514	Continuing	Continuing	Continuing
Program Protection - Program Protection Analysis & Support	C/CPFF	TEAMS : AL, AK, CA, CO, VA	28.112	4.410	Nov 2019	3.122	Nov 2020	2.526	Nov 2021	-		2.526	Continuing	Continuing	Continuing
Program Protection - Program Protection Support	Various	Various : AL, VA, CO	3.560	0.793	Nov 2019	0.415	Nov 2020	0.870	Nov 2021	-		0.870	Continuing	Continuing	Continuing
Threat Systems Engineering - Prior Year Threat Systems Engineering Support no longer funded in FYDP	Various	Various : AL, MD, VA	19.225	0.000		0.000		0.000		-		0.000	0.000	19.225	0.000
Threat Systems Engineering - Threat Systems Engineering	Allot	MDA : VA, AL, CO	22.585	3.731	Oct 2019	3.604	Oct 2020	3.282	Oct 2021	-		3.282	Continuing	Continuing	Continuing
Threat Systems Engineering - Threat Systems Engineering - CSS	C/CPFF	TEAMS, Various : VA, AL	11.309	2.207	Nov 2019	2.725	Nov 2020	3.787	Nov 2021	-		3.787	Continuing	Continuing	Continuing
Threat Systems Engineering - Threat Systems Engineering - CSS 2	C/CPFF	Various : VA, AL	0.000	0.000		0.000		3.195	Nov 2021	-		3.195	Continuing	Continuing	Continuing
Threat Systems Engineering - Threat Systems Engineering - FFRDC	FFRDC	MIT/LL : MA	4.206	1.219	Nov 2019	1.660	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Threat Systems Engineering - Threat Systems Engineering - OGA	MIPR	Various : CA, VA, AL	7.669	0.000		0.000		0.000		-		0.000	0.000	7.669	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD28 / *Intelligence & Security*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Threat Systems Engineering - Threat Systems Engineering - UARC	FFRDC	JHU/APL : MD	5.338	1.626	Nov 2019	2.490	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	279.811	42.554		42.501		39.550		-		39.550	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	279.811	42.554		42.501		39.550		-		39.550	Continuing	Continuing	N/A

Remarks

Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.

Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD28 / *Intelligence & Security*

Significant Event Complete ▲ | Significant Event Planned △ | Milestone Decision Complete ★ | Milestone Decision Planned ☆ | Element Test Complete ◆ | Element Test Planned ◇ | System Level Test Complete ● | System Level Test Planned ○ | Complete Activity ✦ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD28 Intelligence & Security	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
MDA OPSEC Report to USD(I) - 2020				▲																								
Annual Declassification Review - 2020				▲																								
Annual Report to Congress for SAPs (FY 2020)				▲																								
Annual Report to Congress for SAPs (FY 2021)								△																				
ADP - 2021								△																				
Annual Declassification Review - 2021								△																				
Annual Report to Congress for SAPs (FY 2022)												△																
ADP - 2022												△																
MDA OPSEC Report to USD(I) - 2022												△																
Annual Declassification Review - 2022												△																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD28 / *Intelligence & Security*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD28 Intelligence & Security	1	2020	4	2022
MDA OPSEC Report to USD(I) - 2020	4	2020	4	2020
Annual Declassification Review - 2020	4	2020	4	2020
Annual Report to Congress for SAPs (FY 2020)	4	2020	4	2020
Annual Report to Congress for SAPs (FY 2021)	4	2021	4	2021
ADP - 2021	4	2021	4	2021
Annual Declassification Review - 2021	4	2021	4	2021
Annual Report to Congress for SAPs (FY 2022)	4	2022	4	2022
ADP - 2022	4	2022	4	2022
MDA OPSEC Report to USD(I) - 2022	4	2022	4	2022
Annual Declassification Review - 2022	4	2022	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD30 / *BMD Information Management Systems*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD30: *BMD Information Management Systems*	565.001	86.992	84.753	92.729	-	92.729	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Increase from FY 2021 to FY 2022 provides for the implementation of the Qlik Sense capability and purchase of long-lead time hardware for FY 2023.

A. Mission Description and Budget Item Justification

The MDS Information Management Systems budget project funds information technology mission critical functions necessary for the efficient operations and safeguarding of MDS information in compliance with DoD policies and in keeping with the President's declaration on 29 May 2009, "cyber threat is one of the most serious economic and national security challenges we face as a nation". Information Technology (IT) is critical to the day-to-day functions of MDA personnel to communicate (classified and unclassified) with each other, Congress, senior DoD and other U.S. Government agency personnel, Combatant Commander's, NATO partners, and other industry partners. Communication among these organizations facilitates the MDA mission of developing and fielding an integrated MDS to defend the United States, our deployed forces, allies, and friends against all ranges of enemy ballistic missiles in all phases of flight.

MDA information management systems capabilities support rigorous missile defense Research, Development, Test and Engineering (RDT&E) and facilitate the development of technologies to guard against evolving missile threat. Communications are vital for missile defense to continue a viable homeland defense against rogue threats and to provide the integration required to defend deployed forces, allies, and friends against theater threats. MDS information management consists of MDA Special Purpose Processing Nodes (SPPNs), IT systems, data centers, operations and monitoring centers which are vital to support the strategic mission of the Agency and necessary to meet disaster recovery and continuity of operations requirements. This infrastructure is required to sustain access to the Secret Internet Protocol Router Network (SIPRNET), Non secure Internet Protocol Router Network (NIPRNET), MDA classified and unclassified networks, classified and unclassified video teleconferencing services, test and business knowledge data centers, and the Defense Research Engineering Network (DREN). These mission critical functions provide for the efficient operation and safeguarding of all agency information in locations supporting MDA around the world.

Project MD30 is aligned into the following inter-agency mission critical IT services and the associated plans in accordance with the Federal Information Technology Shared Services Strategy.

1. End User Support
2. Special Purpose Processing Nodes (SPPNs)
3. IT Planning and Solutions
4. Unified Communications
5. Portal and Data Services
6. Business Automation Services

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD30 / *BMD Information Management Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: End User Support	7.822	21.476	24.149
Articles:	-	-	-
Description: Provides Information Technology (IT) operations, support and maintenance (24 hours a day, 7 days a week, 365 days a year) to over 10,500 MDA worldwide users (classified and unclassified) executing the MDS Research, Development, Test and Engineering (RDT&E) mission. Services include Integrated Service Desk support (Help Desk and Client Support Services); management of hardware and software maintenance and licensing; and monitoring network activity to ensure users comply with DoD policies for the proper use of information systems. Services also include printing and copying; email and file; directory and authentication services. Includes investments in equipment at end-of-life to comply with Federal and DoD mandated cybersecurity policies. Plans, engineers and implements sustainment projects for common-use IT services and business systems consistent with the IT architecture road map. Provides life-cycle management of over 190,000 IT assets including IT procurement, receiving, shipping/transportation, warehousing, transfers and disposal using the Defense Property Accountability System (DPAS). Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -SEE ABOVE. ***FY 2022 Plans:*** -SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides for purchase of long-lead time hardware for FY 2023.			
Title: Special Purpose Processing Nodes (SPPN)	36.718	4.340	4.809
Articles:	-	-	-
Description: Provides for the developmental engineering and operational strategies and concepts; and planning, design, implementation and maintenance for MDA Research, Development, Test and Evaluation (RDT&E) Special Purpose Processing Nodes (SPPNs) in Huntsville, AL and Colorado Springs, CO. The SPPN infrastructure consists of routers, switches, firewalls, compute, storage and intrusion detection systems that provide Information Technology (IT) support to over 10,500 MDA classified/ unclassified users worldwide. The SPPNs support dynamic and rapid modifications and reconfigurations of network infrastructure in support of RDT&E mission and event unique configurations. Funds provide for network operations and performance monitoring; development of detailed solutions, designs, and plans; Disaster Recovery and Continuity of Operations (DR and COOP) rehearsals; Internet access management; and web filtering. Sustains core communications distribution services across the MDA Enterprise. Includes investments in equipment at end-of-life to comply with Federal and DoD mandated cybersecurity policies.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD30 / *BMD Information Management Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -SEE ABOVE. ***FY 2022 Plans:*** -SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Information Technology (IT) Planning and Solutions ***Articles:*** ***Description:*** Provides Information Technology (IT) engineering support for new requirements analysis, design, planning and implementation of IT solutions for real-world issues. Addresses the increasing demand for more complex IT products and highly specialized IT services. Manages the prioritization and integration of investments in the MDA IT Portfolio to ensure compliance with Federal and DoD polices. Supports the MDA Chief Information Officer Enterprise Architecture Board, Project Steering Committee and the Change Control Board. Ensures compliance with Federal Laws, DoD policies, directives and regulations including: Clinger-Cohen Act, the Federal Information Security Management Act (FISMA), and the Office of Management and Budget (OMB) IT budget reporting policies. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -SEE ABOVE. ***FY 2022 Plans:*** -SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A	8.951 -	13.181 -	13.796 -
Title: Unified Communications ***Articles:*** ***Description:*** Provides for the management, operations and sustainment of classified and unclassified globally deployed video teleconferencing capabilities and equipment. Also includes unclassified desktop instant messaging, wireless services, and	12.953 -	23.187 -	23.481 -

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD30 / *BMD Information Management Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
collaboration capabilities. Provides and implements engineering solutions for all unified communications services. Supports MDA global Research, Development, Test and Engineering (RDT&E) mission for classified and unclassified voice services and interfaces with the Defense Information System Network (DISN) Video Services Global (DVSG), the Defense Research and Engineering Network (DREN), Joint Service Provider (JSP) and commercial vendors. Maintenance agreements and licenses for MDA Enterprise telecommunications equipment classified and unclassified mobile and desktop telephony devices. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -SEE ABOVE. ***FY 2022 Plans:*** -SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Portal and Data Services	11.764	14.431	14.384
Articles:	-	-	-
Description: Provides for the management, operation and maintenance support for the classified and unclassified MDA Portal application and the Information Technology (IT) portal infrastructure. The support includes web-based developmental engineering and operations, planning, design, application implementation, content management and training. Also provides MDA Privacy Office and Civil Liberties compliance and reporting, and provides data management services to accommodate MDA users. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -SEE ABOVE. ***FY 2022 Plans:*** -SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Business Automation Services	4.109	8.138	12.110
Articles:	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD30 / *BMD Information Management Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Description: Provides for the management, operation and maintenance of enterprise business applications for the MDA community to access and share various sources of available data, information and knowledge and enable improved organization, retrieval, manipulation, and storage. Develop and implement an unclassified and classified Qlik Sense business intelligence capability. Operate and maintain nine Defense Business Systems that meet the reporting requirements of Title 10 United States Code section 2222; these include portal-based Electronic Learning Management System (E-LMS), Program Resource Internet Database Environment (PRIDE), Information Management Program Activity control Tool (IMPACT), Standard Procurement System (SPS), Human Resource Tracking System/Personnel Tracking System (HRTS/PTS), TEAMMATE, E-TASKER, TASK MANAGEMENT TOOL (TMT), Electronic Content and Records Tool (ECART). Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -SEE ABOVE. ***FY 2022 Plans:*** -SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides for the implementation of the Qlik Sense capability.			
Title: CARES Act Funding (COVID 19)	4.675	0.000	0.000
Articles:	-	-	-
Description: Provides for priority Information Technology (IT) requirements for the purchase of laptops and labor for 100% telework of MDA employees during the COVID 19 Pandemic. These are CARES Act division B, Title III, requirements. ***FY 2021 Plans:*** N/A ***FY 2022 Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	86.992	84.753	92.729

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD30 / *BMD Information Management Systems*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603176C: *Advanced Concepts and Performance Assessment*	45.852	49.410	15.800	-	15.800	-	-	-	-	-	-
• 0603180C: *Advanced Research*	27.166	35.024	21.466	-	21.466	-	-	-	-	-	-
• 0603294C: *Common Kill Vehicle Technology*	13.319	11.058	0.000	-	0.000	-	-	-	-	-	-
• 0603881C: *Ballistic Missile Defense Terminal Defense Segment*	295.312	312.317	277.949	-	277.949	-	-	-	-	-	-
• 0603882C: *Ballistic Missile Defense Midcourse Defense Segment*	1,275.414	1,219.261	745.144	-	745.144	-	-	-	-	-	-
• 0603884C: *Ballistic Missile Defense Sensors*	348.356	265.803	224.750	-	224.750	-	-	-	-	-	-
• 0603892C: *AEGIS BMD*	722.582	877.336	732.512	-	732.512	-	-	-	-	-	-
• 0603896C: *Ballistic Missile Defense Command and Control, Battle Management & Communication*	550.513	645.741	603.448	-	603.448	-	-	-	-	-	-
• 0603898C: *Ballistic Missile Defense Joint Warfighter Support*	51.095	49.560	50.594	-	50.594	-	-	-	-	-	-
• 0603904C: *Missile Defense Integration and Operations Center (MDIOC)*	54.783	55.356	52.403	-	52.403	-	-	-	-	-	-
• 0603907C: *Sea Based X-Band Radar (SBX)*	137.604	118.318	147.241	-	147.241	-	-	-	-	-	-
• 0603913C: *Israeli Cooperative Programs*	300.000	300.000	300.000	-	300.000	-	-	-	-	-	-
• 0603914C: *Ballistic Missile Defense Test*	398.939	365.208	362.906	-	362.906	-	-	-	-	-	-
• 0603915C: *Ballistic Missile Defense Targets*	545.764	536.133	553.334	-	553.334	-	-	-	-	-	-
• 0604880C: *Land Based SM-3 (LBSM3)*	36.918	56.628	43.158	-	43.158	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD30 / *BMD Information Management Systems*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0901598C: *Management HQ - MDA*	27.065	26.902	24.102	-	24.102	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

This acquisition strategy to provide IT services for MDA consists of three MDA issued contracts. The Integrated Research and Development for Enterprise Solutions (IRES) provides IT design, engineering, implementation and sustainment services. The Research and Development Enterprise Collaboration Services (RECS) provides Video Teleconferencing, Portal, Data and Business Automation Services.

MDA issues multiple Military Interdepartmental Purchase Requests (MIPRs) for leased communications including the Defense Information Systems Agency (DISA), DREN and the US Army.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD30 / *BMD Information Management Systems*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
End User Support - End User Consolidated Support Logistics/Asset Mgmt	C/CPFF	Venturi : AL, CO	0.514	0.383	Nov 2019	0.350	Nov 2020	0.358	Nov 2021	-		0.358	Continuing	Continuing	Continuing
End User Support - End User IT Software & Licenses	MIPR	Accenture : AL, AK, CA, CO, HI, NM, VA	0.000	0.000		0.982	Aug 2021	0.000		-		0.000	0.000	0.982	0.000
End User Support - End User Civilian Pay	Allot	MDA Civilian Pay : AL, CO, NM, VA	21.163	1.881	Oct 2019	2.835	Oct 2020	4.120	Oct 2021	-		4.120	Continuing	Continuing	Continuing
End User Support - End User IT Hardware Support	C/CPAF	Jacobs Engineering : AL, AK, CA, CO, HI, NM, VA	41.953	0.001	Nov 2019	4.944	Nov 2020	7.334	Nov 2021	-		7.334	Continuing	Continuing	Continuing
End User Support - End User IT Software / Licenses	C/CPAF	Jacobs Engineering : AL, AK, CA, CO, HI, NM, VA	17.353	5.556	Nov 2019	6.412	Nov 2020	5.994	Nov 2021	-		5.994	Continuing	Continuing	Continuing
End User Support - End User Operational Support	C/CPAF	Jacobs Engineering : AL, AK, CA, CO, HI, NM, VA	56.695	0.001	Oct 2019	5.953	Oct 2020	6.343	Oct 2021	-		6.343	Continuing	Continuing	Continuing
Special Purpose Processing Nodes (SPPN) - SPPN Civilian Pay	Allot	MDA Civilian Pay : AL, CO, VA	8.581	0.506	Oct 2019	1.041	Oct 2020	1.512	Oct 2021	-		1.512	Continuing	Continuing	Continuing
Special Purpose Processing Nodes (SPPN) - SPPN Licenses	C/CPAF	Jacobs Engineering : AL, CO, VA	80.362	9.000	Nov 2019	1.984	Nov 2020	2.087	Nov 2021	-		2.087	Continuing	Continuing	Continuing
Special Purpose Processing Nodes (SPPN) - SPPN Operational Support	C/CPAF	Jacobs Engineering : AL, CO, VA	73.523	27.212	Jan 2020	1.315	Jan 2021	1.210	Jan 2022	-		1.210	Continuing	Continuing	Continuing
Information Technology (IT) Planning and Solutions - IT Planning and Solutions Travel / PCS	Allot	MDA Civilian Travel : AL, CO, VA	0.000	0.000		0.000		0.333	Oct 2021	-		0.333	Continuing	Continuing	Continuing
Information Technology (IT) Planning and Solutions	Allot	MDA Civilian Pay : AL, CO, VA	8.200	1.783	Oct 2019	1.539	Oct 2020	2.236	Oct 2021	-		2.236	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD30 / *BMD Information Management Systems*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
- IT Planning and Solutions Civilian Pay															
Information Technology (IT) Planning and Solutions - IT Planning and Solutions Consolidated Support	C/CPFF	Five Stones, Yorktown, Peopletec : AL, CO, VA	27.486	3.765	Aug 2020	6.764	Aug 2021	6.402	Aug 2022	-		6.402	Continuing	Continuing	Continuing
Information Technology (IT) Planning and Solutions - IT Planning and Solutions Operational Support	C/CPAF	Jacobs Engineering : AL, CO, VA	40.720	0.503	Mar 2020	2.478	Mar 2021	2.377	Mar 2022	-		2.377	Continuing	Continuing	Continuing
Information Technology (IT) Planning and Solutions - IT Planning and Solutions SWDC PNT	C/CPFF	Northrup Grumman : AL, CO, VA	3.996	2.900	Oct 2019	2.400	Mar 2021	2.448	Mar 2022	-		2.448	Continuing	Continuing	Continuing
Unified Communications - Unified Communications Civilian Travel / PCS	Allot	MDA Civilian Travel : Al, CO, VA	0.000	0.000		0.200	Oct 2020	0.000		-		0.000	0.000	0.200	0.000
Unified Communications - Unified Communications Civilian Pay	Allot	MDA Civilian Pay : Al, CO, VA	7.415	2.023	Oct 2019	0.996	Oct 2020	1.450	Oct 2021	-		1.450	Continuing	Continuing	Continuing
Unified Communications - Unified Communications Hardware Licenses	C/CPIF	Jacobs Engineering : AL, CO, VA	2.536	1.850	Nov 2019	1.392	Nov 2020	1.405	Nov 2021	-		1.405	Continuing	Continuing	Continuing
Unified Communications - Unified Communications Leased Communications/ Licenses	MIPR	DISA/DREN/IT2S : AL, AK, CA, CO, HI, NM, VA	27.786	3.003	Oct 2019	7.008	Oct 2020	9.107	Oct 2021	-		9.107	Continuing	Continuing	Continuing
Unified Communications - Unified Communications Operational Support	C/CPAF	Jacobs Engineering : AL, CO, VA	12.096	2.037	Oct 2019	2.671	Dec 2020	3.118	Nov 2021	-		3.118	Continuing	Continuing	Continuing
Unified Communications - Unified Communications VTC Operations Support	C/CPIF	Network Management Resources : AL, AK, CO, NM, VA	40.227	0.081	Nov 2019	8.767	Apr 2021	7.006	Apr 2022	-		7.006	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD30 / *BMD Information Management Systems*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Unified Communications - Unified Communications Wireless Services	C/FFP	AT&T : AL, CO, VA	7.601	1.983	Nov 2019	2.153	Oct 2020	1.395	Oct 2021	-		1.395	Continuing	Continuing	Continuing
Unified Communications - VTC HW/Break-Fix	C/CPIF	Network Management Resources : AL, CO, VA	1.209	1.976	Nov 2019	0.000		0.000		-		0.000	0.000	3.185	0.000
Portal and Data Services - Portal and Data Services Civilian Pay	Allot	MDA Civilian Pay : AL, CO, VA	6.057	1.686	Oct 2019	0.831	Oct 2020	1.208	Oct 2021	-		1.208	Continuing	Continuing	Continuing
Portal and Data Services - Portal and Data Services Operational	C/CPAF	Online Subscriptions Services : AL, CO, VA	2.674	0.455	Oct 2019	0.350	Oct 2020	0.354	Oct 2021	-		0.354	Continuing	Continuing	Continuing
Portal and Data Services - Portal and Data Services Operational Support	C/FFP	Network Management Resources : AL, CO, VA	25.001	5.801	Apr 2020	6.200	Apr 2021	6.086	Apr 2022	-		6.086	Continuing	Continuing	Continuing
Portal and Data Services - Portal and Data Services Operations and Support	C/CPAF	Jacobs Engineering : AL, CO, VA	11.877	3.822	Jan 2020	7.050	Jan 2021	6.736	Jan 2022	-		6.736	Continuing	Continuing	Continuing
Business Automation Services - Business Automation Cloud E Cart	MIPR	TBD : AL, CO, VA	0.000	0.000		0.000		0.613	Sep 2022	-		0.613	Continuing	Continuing	Continuing
Business Automation Services - Business Automation Civilian Pay	Allot	MDA Civilian Pay : AL, CO, VA	3.844	0.506	Oct 2019	0.331	Oct 2020	0.485	Oct 2021	-		0.485	Continuing	Continuing	Continuing
Business Automation Services - Business Automation E-Tasker/ Accenture Task Mgt Tool	Various	TBD : AL, CO, VA	0.000	0.000		0.000		0.234	Oct 2021	-		0.234	Continuing	Continuing	Continuing
Business Automation Services - Business Automation ELMS/ USA Learning	MIPR	TBD : AL, CO, VA	0.000	0.000		0.000		0.291	Oct 2021	-		0.291	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD30 / *BMD Information Management Systems*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Business Automation Services - Business Automation Human Resources Tracking System	Various	TBD : AL, CO, VA	0.000	0.000		0.000		0.557	Oct 2021	-		0.557	Continuing	Continuing	Continuing
Business Automation Services - Business Automation Licenses	C/CPAF	Jacobs Engineering : AL, CO, VA	6.421	0.991	Nov 2019	0.000		0.000		-		0.000	0.000	7.412	0.000
Business Automation Services - Business Automation Operational Support	C/CPAF	Jacobs Engineering : AL, CO, VA	29.587	2.612	Jan 2020	7.807	Jan 2021	6.208	Jan 2022	-		6.208	Continuing	Continuing	Continuing
Business Automation Services - Business Automation QLIK	C/CPAF	TBD : AL, CO, VA	0.000	0.000		0.000		3.132	Jun 2022	-		3.132	Continuing	Continuing	Continuing
Business Automation Services - Business Automation Service Support	C/FFP	Network Management Resources : AL, CO, VA	0.000	0.000		0.000		0.590	Mar 2022	-		0.590	Continuing	Continuing	Continuing
Business Automation Services - Business Automation Services Support	MIPR	CACI : AL, CO, VA	0.124	0.000		0.000		0.000		-		0.000	0.000	0.124	0.000
CARES Act Funding (COVID 19) - CARES IT Hardware Support	C/CPAF	Jacobs Engineering : AL, AK, CA, CO, HI, NM, VA	0.000	4.675	Aug 2020	0.000		0.000		-		0.000	0.000	4.675	0.000
		Subtotal	565.001	86.992		84.753		92.729		-		92.729	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	565.001	86.992		84.753		92.729		-		92.729	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD30 / *BMD Information Management Systems*	

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD30 / *BMD Information Management Systems*

Significant Event Complete ▲ Milestone Decision Complete ★ Element Test Complete ◆ System Level Test Complete ● Complete Activity ✦
Significant Event Planned △ Milestone Decision Planned ☆ Element Test Planned ◇ System Level Test Planned ○ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
Manage DoD Mandated Business Applications and Sustain MDA Financial and Contractual Support Systems - Follow-On	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Operate and Maintain General Information Technology Services 18 hours per day, 6 days per week - Follow-On	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Revise and Test Contingency Plans for Information Technology Systems - Follow-On	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Operate and Maintain Classified and Unclassified MDA Knowledge Online Services - Follow-On	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Procure, Implement, and Asset Control for Information Technology Operational Systems -Follow-On	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Provide 18 hours per day, 6 days per week Network and Helpdesk Services for General Information Technology Services for MDA Workforce - Follow-On	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Fund Recurring Leased Circuits, Maintenance Agreements and Licenses for MDA Enterprise - Follow-On	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Operate, Monitor and Sustain Recurring Classified and Unclassified Telecommunication Requirements for Unified Communications - Follow-On	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Sustain the BMDS Integrated Master Schedule and the Ballistic Missile Defense Asset Management Tool - Follow-On	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Perform Analysis, Track, and Report Metrics on Equipment Lifecycle - Follow-On	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Sustain the Information Technology Infrastructure Across the MDA Enterprise - Follow-On	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Operate, Monitor and Sustain Recurring Operations for Video Teleconferencing for Unified Communications Follow-On	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD30 / *BMD Information Management Systems*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Manage DoD Mandated Business Applications and Sustain MDA Financial and Contractual Support Systems - Follow-On	1	2020	4	2022
Operate and Maintain General Information Technology Services 18 hours per day, 6 days per week - Follow-On	1	2020	4	2022
Revise and Test Contingency Plans for Information Technology Systems - Follow-On	1	2020	4	2022
Operate and Maintain Classified and Unclassified MDA Knowledge Online Services - Follow-On	1	2020	4	2022
Procure, Implement, and Asset Control for Information Technology Operational Systems -Follow-On	1	2020	4	2022
Provide 18 hours per day, 6 days per week Network and Helpdesk Services for General Information Technology Services for MDA Workforce - Follow-On	1	2020	4	2022
Fund Recurring Leased Circuits, Maintenance Agreements and Licenses for MDA Enterprise - Follow-On	1	2020	4	2022
Operate, Monitor and Sustain Recurring Classified and Unclassified Telecommunication Requirements for Unified Communications - Follow-On	1	2020	4	2022
Sustain the BMDS Integrated Master Schedule and the Ballistic Missile Defense Asset Management Tool - Follow-On	1	2020	4	2022
Perform Analysis, Track, and Report Metrics on Equipment Lifecycle - Follow-On	1	2020	4	2022
Sustain the Information Technology Infrastructure Across the MDA Enterprise - Follow-On	1	2020	4	2022
Operate, Monitor and Sustain Recurring Operations for Video Teleconferencing for Unified Communications Follow-On	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MC30 / *Cyber Operations*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MC30: *Cyber Operations*	159.570	115.404	64.659	78.248	-	78.248	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Accomplishments map to the Office of Management and Budget (OMB) and Office of the Secretary of Defense (OSD) approved Cybersecurity Taxonomy including 1) Preventing Malicious Activity, 2) Detect, Analyze and Mitigate Intrusions, 3) Planning, Policy Development and Workforce Management, 4) Continuous Monitoring and 5) Outside Federal Outreach, Defense Industrial Base.

Increase from FY 2021 to FY 2022 provides for the staffing and implementation of a Defensive Cyber Operations Capability; the addition of the MDS (Weapons Systems) Cybersecurity Service provider (CSSP); and provides a movement of funds from PE 0603882C: Ballistic Missile Defense Midcourse Defense Segment, MC08: Cyber Operations out of the Network / System Certification and Accreditation (C&A) accomplishment.

A. Mission Description and Budget Item Justification

A number of key Information Technology (IT) strategies were identified in the DoD Information Technology Enterprise Strategy and Roadmap issued by the Deputy Secretary of Defense in 2011. The IT Roadmap specifically addresses the need to improve Cybersecurity. It states that DoD networks are under constant attack from cybersecurity threats launched from various sources. MDA must meet the National Command Authority Directives for rapid deployment of the MDS while complying with the key principles of the Cybersecurity standards to ensure MDA remains a secure member of the DoD Information Network (DODIN).

DoD Instruction 8500.01 Cybersecurity issued in March 2014, requires continuous monitoring, data analysis, reporting and incident mitigation of DoD classified and unclassified, mission, test and administrative networks. To comply with the Instruction, MDA must implement a multi-tiered cybersecurity risk management capability to protect critical Missile Defense System (MDS) data and systems from rapidly evolving internal and external threats.

The issuance of DoD Instruction 8510.01, Risk Management Framework (RMF) Information Technology in March 2014 requires additional resources to implement, manage, monitor and report as a result of a thirty-five percent increase in controls (237 controls with 817 enhancements). DoD 8510.01 also states that resources for implementing the RMF must be identified and allocated as part of the Defense planning, programming, budgeting, and execution process. The Controls must be tested on all IT supporting research, development, test and evaluation and DoD-controlled IT operated by a contractor or other entity on behalf of DoD and reported.

This project provides funds to sustain the Risk Management Framework (RMF) and Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments and reviews of proposed Program Manager/Information Systems Security Manager (PM/ISSM) Plan of Action and Milestones (POA&M) for the MDA mission, test and common-use IT systems. Maintains the Authorization and Assessment (A&A) data repository, capturing the RMF documentation (artifacts, validation results, and Cybersecurity Risk Assessment results, and Authorizing Official (AO) decisions) and POA&M on all MDA information systems. Supports the monitoring and tracking of Cybersecurity mitigations detailed in IT cybersecurity POA&Ms. Activities include preparation of A&A documentation and authorization recommendations to the MDA PM/ISSM and AO. Independent Verification and Validation (IV&V) team actions ensure the availability, integrity, confidentiality and non-repudiation of the MDA mission, test and common-use IT systems. Activities in the Project are necessary to comply with Federal Information Security Management Act (FISMA).

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MC30 / *Cyber Operations*

This project funds the MDA Global Network Operations and Security Center(GNOSC) responsible for monitoring, managing, patching, and maintaining MDA network and core IT services; issuing and tracking Technical Compliance Orders; and coordinating overarching Enterprise NetOps. The GNOSC provides the network security operations centers and supporting processes to protect and defend the MDA Enterprise information and information systems.

The MDA Computer Emergency Response Team (CERT), MDA's Tier 2 Cybersecurity Service Provider (CSSP) monitors the MDA classified and unclassified information technology RDT&E and common-use IT networks and reports vulnerabilities. The MDA CERT coordinates with U.S. Cyber Command to identify and implement network vulnerability updates and patches to comply with U.S. Cyber Command vulnerabilities identified for DoD networks. During FY 2020 began the development of the MDS (Weapons Systems) Cybersecurity Service provider (CSSP) as a fully accredited Tier II in accordance with CJCSI 6510.01F, DoD O-8530.1, and the DoD Cybersecurity Discipline Implementation Plan.

The project funds Cybersecurity governance management and administrative management support, annual Agency-wide computer-based IA training and metrics reporting, implementation of Public Key Infrastructure and Enabling Communication Security (COMSEC) related activities.

Facility-related control systems (FRCS) include building management systems (BMS), electronic security systems (ESS), industrial control systems (ICS) and supervisory control and data acquisition (SCADA) systems in support of facility operations.

This project provides for the management of MDA's FRCS cybersecurity program, cybersecurity engineering for FRCS incorporated in MDA facility plans for construction and upgrades, as well as the implementation of RMF and Computer Network Defense (CND) on FRCS in MDA facilities.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Preventing Malicious Cybersecurity Activity	28.325	16.544	18.543
Articles:	-	-	-
Description: Provide: Federal Information Security Management Activity Act (FISMA)-related activities; Intrusion Prevention Systems; Trusted Internet Connections; Identity Management and Authentication; Supply Chain Management; Network & Data Protection and Insider Threat Mitigation Activities. This effort includes integration and test capabilities for element interface verification and provide operations and sustainment of the deployed Position, Navigation, and Timing (PNT) Last Mile integration capabilities at MDS locations. Recurring Activities for Preventing Malicious Cyber Attacks: -Maintain a current Cybersecurity risk and residual risk assessment of the MDS. -Coordinate Cybersecurity compliance for all IT projects and remote sites. -Implement measures to prevent unauthorized access to MDA Information Systems (IS) based on analysis of threat vectors. Evaluate known threats against vulnerabilities to determine mitigation strategies. -Track ports, protocols, and services.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MC30 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Coordinate with private partnerships to ensure the Defense Industrial Base protects MDA data. ***FY 2021 Plans:*** -SEE ABOVE. ***FY 2022 Plans:*** -Implement a Defensive Cyber Operations Capability ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022, provides for the staffing and implementation of a Defensive Cyber Operations Capability			
Title: Planning, Policy Development, Workforce Training & Force Management	2.390	4.164	4.794
Articles:	-	-	-
Description: Provide National Initiative for Cybersecurity Education (NICE); Workforce Development; Security Training for Employees with Significant Security Responsibilities; and Cybersecurity Strategic Planning, Policy, Oversight and Management. Recurring Activities for the Planning, Policy Development, Workforce Training and Force Management Accomplishment: -Document and maintain Standard Operating Instructions/Procedures for consistent interface with the MDA MDS Network Operations Support Center (BNOSC) and the MDS elements. -Publish MDA policies to incorporate new requirements stated in DoDI 8510.01 Risk Management Framework (RMF) to comply with 237 new controls and 817 control enhancements into controls validation testing of MDS elements and networks. -Manage the Information Assurance Workforce Improvement Program to certify Cybersecurity professionals and report compliance in accordance with Federal Information Security Management Act (FISMA) and Information Assurance Workforce Improvement Program (DoD Manual 8570.1), achieving the DoD certification goal; reports IA Risk Assessments, Primary RMF artifacts. -Interface with other combatant commands to provide MDS Mission RMF package. -Conduct an annual IA Security review of the MDS in accordance with DoDI 8510.01 and provide an analysis of changes in IA posture. -Collect, analyze, and report vulnerability and cyber warfare attack metrics to the MDA CIO, MDA leadership, and U.S. Cyber Command. -Provide Cybersecurity engineering and planning guidance and vulnerability assessment for all MDA Information Technology acquisition programs. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MC30 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-SEE ABOVE. ***FY 2022 Plans:*** -SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides for additional government support to standardize processes to enable more efficient execution of cybersecurity resulting in improved preparedness for future inspections and cybersecurity tests.			
Title: Continuous Monitoring ***Articles:*** ***Description:*** Provide Information Technology (IT) Security Tools and Other Continuous Monitoring. Recurring Activities for the Continuous Monitoring Accomplishment: -Manage data-at-rest encryption to ensure compliance with DoD mandated policies. -Procure/renew cybersecurity software licensing agreements for IT Security Tools. -Procure/renew cybersecurity hardware maintenance for hardware. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -SEE ABOVE. ***FY 2022 Plans:*** -SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A	17.225 -	8.230 -	8.228 -
Title: Detect, Analyze and Mitigate Intrusions ***Articles:*** ***Description:*** Provide cybersecurity activities including: Federal Incident Response Centers; National Institute of Standards for Technology (NIST) SP 800.53 Implementation; Cyber Threat Analysis; Cyber Continuity of Operations (COOP); Incident Response and Remediation; Forensics and Damage Assessment; and Computer Emergency Response Teams. Recurring Activities for the Detect, Analyze and Mitigate Intrusions Accomplishment: -Test Risk Management Framework (RMF) controls on all IT supporting research, development, test and evaluation and DoD-controlled Information Technology (IT) operated by a contractor or other entity on behalf of DoD and reported.	67.297 -	35.550 -	45.586 -

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MC30 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Conduct RMF analysis and reporting for the MDS such as evaluation of residual risk by incorporating current and proposed MDS monitoring and mitigations. -Maintain MDA Computer Emergency Response Team (MDA CERT) as a fully accredited Tier II Cybersecurity Service provider (CSSP) in accordance with CJCSI 6510.01F and DoD O-8530.1. -Perform CSSP services (protect, detect, respond and sustain) for all MDA Common-use IT Services, MDA Mission and test networks and enclaves 24 hours a day, 7 days a week, 365 days a year. -Conduct application testing that looks for vulnerabilities and issues using a number of tactics, technical and procedures. -Conduct vulnerability scanning of MDA network to assess risks to MDA data from inside and outside sources. -Conduct monthly cybersecurity vulnerability audits. -Issue and track implementation of Information Assurance Vulnerability Alerts (IAVA), Bulletins and Technical Advisories. -Implement Information Assurance Vulnerability Alerts (IAVA) and Communication Tasking Orders remediation and patches. -Perform network security monitoring of all MDA subscriber networks and enclaves. -Conduct system forensic analysis, review content of compromised system, document files and data, and identify tactics, techniques and procedures used by an attacker to gain access. -Develop and maintain the RMF package for the MDS Mission System to support a full Authorization to Operation (ATO). -Compile and validate MDS Mission Element-level authorization and assessment documents to include MDS Element-level System Security Plans (SSPs), Security Controls Traceability Matrix (SCTM), Plan of Action and Milestone (POA&M) artifacts and support conduct of Control Validation Testing (CVT). Execute controls validation integration testing as part of developmental testing efforts for the MDS. -Ensure MDA mission, test, and common-use IT systems are operated securely in accordance with DoD Risk Management Framework policies. -Prepare and maintain current RMF documentation for MDA networks and systems reported to DoD and Office of Management and Budget (OMB). Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -SEE ABOVE. ***FY 2022 Plans:*** -Develop and maintain the MDS (Weapons Systems) Cybersecurity Service provider (CSSP) as a fully accredited Tier II in accordance with CJCSI 6510.01F, DoD O-8530.1, and the DoD Cybersecurity Discipline Implementation Plan. ***FY 2021 to FY 2022 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MC30 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Increase from FY 2021 to FY 2022 provides the addition of the MDS (Weapons Systems) Cybersecurity Service provider (CSSP).			
Title: Outside Federal Outreach - Defense Industrial Base	0.167	0.171	0.159
Articles:	-	-	-
Description: Review current Cybersecurity Policies and coordinating with MDA Missile Defense System (MDS) Programs to ensure all applicable Cybersecurity clauses are included into MDA contracts with MDA Industry partners in the Defense Industrial Base (DIB) to ensure protection of MDS Controlled Unclassified Information (CUI). Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -SEE ABOVE. ***FY 2022 Plans:*** -SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Facility Related Control Systems (FRCS)	0.000	0.000	0.938
Articles:	-	-	-
Description: Provide Facility-Related Control Systems (FRCS) program oversight to include policies, procedures, plans, reports and budgets to support agency FRCS. - Systems development, inventory, assessment, mitigation and sustainment IAW DoDI 8500.01 Cybersecurity and DoDI 8510.01 Risk Management Framework (RMF) throughout the life cycle of each FRCS. - Manage the cybersecurity activities to protect the FRCS, including vulnerability assessment and management, malware protection, information system continuous monitoring (ISCM), cyber incident handling, and auditing to detect, deter, and mitigate insider threats, IAW DoDI 8530.01 Cybersecurity Activities Support to DoD Information Network Operations. - Oversee the development of FRCS in facilities to ensure cybersecurity is designed and built into the system IAW Unified Facilities Criteria (UFC) 4-010-06 Cybersecurity Of Facility-Related Control Systems to reduce cybersecurity risk and ensure compliance with applicable National Institute of Standards and Technology (NIST) Special Publication (SP) 800-53 security controls. - Manage the training and development of the FRCS cybersecurity workforce to ensure all personnel are qualified to perform assigned cybersecurity duties IAW DoDD 8140.01 Cyberspace Workforce Management. ***FY 2021 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MC30 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
N/A ***FY 2022 Plans:*** -SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides a movement of funds from PE 0603882C: Ballistic Missile Defense Midcourse Defense Segment in MC08: Cyber Operations out of the Network / System Certification and Accreditation (C&A) accomplishment. FRCS was realigned to the BMD Enabling Program to better align with all of the Missile Defense Agency facilities that will be assessed and supported.			
Accomplishments/Planned Programs Subtotals	115.404	64.659	78.248

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Integrated Research and Development for Enterprise Solutions (IRES) provides IT design, engineering, implementation and sustainment services.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MC30 / *Cyber Operations*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Preventing Malicious Cybersecurity Activity - COMSEC	MIPR	National Security Agency : AL, CO, VA	0.000	0.200	Mar 2020	0.221	Apr 2021	0.223	Apr 2022	-		0.223	Continuing	Continuing	Continuing
Preventing Malicious Cybersecurity Activity - Civilian Pay	Allot	Civilian Pay : AL, CO, VA, NM	3.480	1.408	Oct 2019	1.649	Oct 2020	2.602	Oct 2021	-		2.602	Continuing	Continuing	Continuing
Preventing Malicious Cybersecurity Activity - Consolidated Support CSM	C/CPFF	Booz, Allen & Hamilton : AL, CO, VA	1.474	0.701	Mar 2020	0.000		0.689	Mar 2022	-		0.689	Continuing	Continuing	Continuing
Preventing Malicious Cybersecurity Activity - Cyber CSS	C/CPAF	Jacobs Engineering : AL, COL, VA	23.505	26.016	Jan 2020	14.674	Nov 2020	15.029	Nov 2021	-		15.029	Continuing	Continuing	Continuing
Planning, Policy Development, Workforce Training & Force Management - A&AS Cyber BMDS CSM/CND	C/CPFF	Booz, Allen & Hamilton : AL, CO, VA	4.451	0.962	Aug 2020	3.048	Nov 2020	1.914	Nov 2021	-		1.914	Continuing	Continuing	Continuing
Planning, Policy Development, Workforce Training & Force Management - Civilian Pay	Allot	Civilian Pay : AL, CO, NM, VA	2.450	1.428	Oct 2019	1.116	Oct 2020	1.763	Oct 2021	-		1.763	Continuing	Continuing	Continuing
Planning, Policy Development, Workforce Training & Force Management - FFRDC	MIPR	MITRE : VA	0.000	0.000		0.000		0.449	Nov 2021	-		0.449	Continuing	Continuing	Continuing
Planning, Policy Development, Workforce Training & Force Management - JWIC	MIPR	DIA : VA	0.000	0.000		0.000		0.668	Jan 2022	-		0.668	Continuing	Continuing	Continuing
Continuous Monitoring - Continuous Monitoring - IT Security Tools	C/CPAF	Jacobs Engineering : AL, CO, VA	12.166	17.225	Jan 2020	8.230	Jan 2021	8.228	Jan 2022	-		8.228	Continuing	Continuing	Continuing
Detect, Analyze and Mitigate Intrusions - A&AS, BMDS CSM/CND	C/CPFF	Booz, Allen & Hamilton : AL, CO, VA	2.592	1.390	Aug 2020	2.489	Aug 2021	2.538	Aug 2022	-		2.538	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MC30 / *Cyber Operations*	

Support ($ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 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
Detect, Analyze and Mitigate Intrusions - A&AS, Cyber Risk Mgmt	C/CPFF	Decisive Analytics Corporation : AL, CO, VA	6.772	3.904	Mar 2020	3.985	Mar 2021	4.065	Mar 2022	-		4.065	Continuing	Continuing	Continuing
Detect, Analyze and Mitigate Intrusions - Civilian Pay	Allot	Civilian Pay : AL, CO, NM,, VA	5.575	2.823	Oct 2019	2.267	Oct 2020	3.695	Oct 2021	-		3.695	Continuing	Continuing	Continuing
Detect, Analyze and Mitigate Intrusions - Civilian Travel / PCS	Allot	Civilian Travel : AL, CO, NM,, VA	0.000	0.000		0.200	Oct 2020	0.404	Nov 2021	-		0.404	Continuing	Continuing	Continuing
Detect, Analyze and Mitigate Intrusions - Cyber CSS	C/CPAF	Jacobs Engineering : AL, CO, VA	89.714	53.180	May 2020	26.609	Jan 2021	26.611	Jan 2022	-		26.611	Continuing	Continuing	Continuing
Detect, Analyze and Mitigate Intrusions - Cyber Customer Support	C/CPAF	Network Management Resources : AL, CO, VA	6.775	2.000	Mar 2020	0.000		0.000		-		0.000	0.000	8.775	8.775
Detect, Analyze and Mitigate Intrusions - Network/System assessment and authorization contract support services	C/FFP	Booz, Allen & Hamilton, : VA	0.450	4.000	Feb 2020	0.000		0.000		-		0.000	0.000	4.450	4.450
Detect, Analyze and Mitigate Intrusions - Tier II CSSP	MIPR	Air Force : AL, CO, NM, VA	0.000	0.000		0.000		8.273	Apr 2022	-		8.273	Continuing	Continuing	Continuing
Outside Federal Outreach - Defense Industrial Base - Civilian Pay	Allot	MDA Civilian Pay : AL, CO, NM, VA	0.166	0.167	Oct 2019	0.171	Oct 2020	0.159	Oct 2021	-		0.159	Continuing	Continuing	Continuing
Facility Related Control Systems (FRCS) - Cyber Security and Cyber Resiliency	MIPR	Booz Allen Hamilton : AL, VA	0.000	0.000		0.000		0.938	Nov 2021	-		0.938	Continuing	Continuing	Continuing
		Subtotal	159.570	115.404		64.659		78.248		-		78.248	Continuing	Continuing	N/A

Remarks

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MC30 / *Cyber Operations*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	159.570	115.404		64.659		78.248		-		78.248	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MC30 / *Cyber Operations*

Significant Event Complete ▲ | Significant Event Planned △ | Milestone Decision Complete ★ | Milestone Decision Planned ☆ | Element Test Complete ◆ | Element Test Planned ◇ | System Level Test Complete ● | System Level Test Planned ○ | Complete Activity ✦ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
PNT Operations and Maintenance	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Report Vulnerability and Cyber Warfare Attack Metrics to the MDA Chief Information Officer, MDA Leadership, and Cyber Command - Follow-On	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Monitor Networks and Systems to Defend Mission, Test, and Administrative Systems on a 24 hours per day, 7 days per week, 365 days per year basis for Information Assurance - Follow-On	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Provide Information Assurance Engineering and Planning Guidance and Vulnerability Assessment for Information Technology Acquisition Programs - Follow-On	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Conduct Information Assurance Certification Evaluation of Mission, Test, and Administrative Systems - Follow-On	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Complete Annual Information Assurance user Training for MDA Workforce - Follow-On	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Implement Information Assurance Vulnerability Alert Control Improvements for General Information Technology Services - Follow-On	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Procure, Implement, and Asset Control of Hardware maintenance and Software Licenses for Monitoring Systems of Information Assurance - Follow-On	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MC30 / *Cyber Operations*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
PNT Operations and Maintenance	1	2020	4	2022
Report Vulnerability and Cyber Warfare Attack Metrics to the MDA Chief Information Officer, MDA Leadership, and Cyber Command - Follow-On	1	2020	4	2022
Monitor Networks and Systems to Defend Mission, Test, and Administrative Systems on a 24 hours per day, 7 days per week, 365 days per year basis for Information Assurance - Follow-On	1	2020	4	2022
Provide Information Assurance Engineering and Planning Guidance and Vulnerability Assessment for Information Technology Acquisition Programs - Follow-On	1	2020	4	2022
Conduct Information Assurance Certification Evaluation of Mission, Test, and Administrative Systems - Follow-On	1	2020	4	2022
Complete Annual Information Assurance user Training for MDA Workforce - Follow-On	1	2020	4	2022
Implement Information Assurance Vulnerability Alert Control Improvements for General Information Technology Services - Follow-On	1	2020	4	2022
Procure, Implement, and Asset Control of Hardware maintenance and Software Licenses for Monitoring Systems of Information Assurance - Follow-On	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD31 / *Modeling & Simulation*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD31: *Modeling & Simulation*	347.084	82.344	107.710	87.068	-	87.068	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2021 to FY 2022 reflects transition from development to implementation of the initial Enterprise digital M&S product.

A. Mission Description and Budget Item Justification

MDA's Modeling and Simulation (M&S) program develops system-level models, frameworks, truth, simulations, and operational representations as missile defense technologies continually advance and the threat changes, and evaluates performance of the Elements, Components, and overall Missile Defense System for verification, validation and accreditation purposes. MDA's M&S program provides a cost effective means to assess and examine Missile Defense performance space beyond what can be physically tested under current test range conditions and within the Agency's fiscal constraints. M&S future concept simulation activities provide the capability to design and develop technologies to hedge against future missile threats. MDA's M&S systems and products provide analysis, decision-making, and planning capabilities for Real-World Operations to inform the National Command Authority, Joint Staff, Military Services, NATO, Combatant Commanders (CCMDs), Operational Test Authority (OTAs), Director of Operational Test & Evaluation (DOT&E), and Allies.

The strategy of MDA's M&S Program is 1) to execute a single, integrated, and synchronized program to manage M&S development and sustainment, 2) to improve System Flight and Ground Test execution and provide digital assessment venue, 3) to leverage MDA test activities to collect data to anchor M&S, and 4) to perform Warfighter training and tactics validation. The strategy also incorporates key elements to address DOT&E assessments; Ensure that future M&S architectures are composable and flexible, and simplify the integration process to conserve resources and improve capabilities; Ensure that future M&S architectures incorporate and require the use of consistent truth representations (phenomenology, lethality, environmental factors, threat simulations, etc.); Improve cross-organizational system engineering processes to optimize requirements generation and ensure the inclusion of all stakeholders; Develop refined M&S accreditation criteria between MDA and the OTA; Enable top-down systems engineering and management of agency-wide M&S federations.

MDA's M&S Program consists of system and product planning, development, integration, and operation; threat model development, verification, and analysis; and integration and deployment of MDA's distributed real-time Hardware-in-the-Loop (HWIL) and digital M&S simulation capabilities. Models and simulations are tailored to the specific needs of the Agency's test events and to match MDS components in their various stages of development, ranging from low-to-medium fidelity analyses supporting concept definitions studies, to high-fidelity models used to support engineering level activities. MDA validates and accredits System-level models and simulations by anchoring them to ground and flight test events, per the Integrated Master Test Plan (IMTP), to enable accurate and comprehensive assessments.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: M&S Requirements, Design Support, Scenario Optimization	11.363	10.869	9.795
Articles:	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD31 / *Modeling & Simulation*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Description: This activity provides the integrated program lifecycle planning and requirements definition of all MDS M&S models and capabilities to enable assessment of capability deliveries. M&S capability development executes an integrated, synchronized program to manage M&S development in support of MDS development, testing, and assessment. The following actions are required on a continuing basis to accomplish the M&S lifecycle planning and requirements definition mission: - Maintain traceability between the M&S Systems Requirements Documents and M&S product development - Produce capability documents and specifications for M&S product development to enable all Digital assessment, System flight and HWIL tests, training events, exercises, wargames, concept evaluation and development engineering - Support MDA response to export requests for M&S software and technical data to nations or international organizations - Participate in Technical Interchange Meetings and provide support for bilateral agreements with allies and partners - Support system engineering capability trades for all MDS capability deliveries - Provide integrated program lifecycle planning and scheduling of all System-level M&S models and capabilities to enable assessment of capability deliveries for Homeland and Regional Defense - Execute M&S planning, development, framework and test integration; threat model development, verification, and analysis; and integration and deployment of MDA's distributed real-time Hardware-in-the-Loop (HWIL) and digital M&S simulation capabilities - Develop/sustain models and simulations tailored to the specific needs of the Agency's test events; match MDS components in their various stages of development or sustainment as required for the test venue Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects consolidation of MDA simulation capabilities.			
Title: BMDS Simulations & Tools	11.119	13.437	15.900
Articles:	-	-	-
Description: This activity funds the development and sustainment of digital products and the architecture framework, and delivery/maintenance of infrastructure for Missile Defense performance assessments, Warfighter events, engineering studies/ analyses, and International Simulation events. The following actions are required on a continuing basis: Event Integration/Support Operations:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD31 / *Modeling & Simulation*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Deliver integrated architecture instantiations of the MDS to support Performance Assessments and integration of new capabilities into the Operational Capability Baseline - Integrate, test, and verify the M&S enterprise supporting System-level testing, assessment, exercises, and wargaming, including testing infrastructure - Integrate, test, functionally qualify, and deliver M&S tools and complex test architectures to provide system test capabilities to support MDA IMTP based test events, wargames, and exercises - Maintain simulations for System and Element M&S development laboratories - Conduct integration, testing and system-level verification per the digital System Requirements Document (SRD); operate the testbed to mature the OSF-based digital system simulation - Provide Event Integration Support for non-MDA Missile Defense component and weapon system models for use in MDA test and validation events - Provide HWIL/M&S benchmarking/integration, documentation and coordination; sustain, integrate and execute ground tests, and Exercises/Wargames - Provide communications emulation (MTJ, STJ, and Link-16) and network analysis support via the Tactical Communications Environment Segment (TCES) - Perform operational planning for planned MDS assessment events - Conduct M&S system integration and verification and conduct developmental integration testing M&S Operations: - Provide digital representations of MDS elements/components using MDA's International Simulation (I-SIM) in support of Combatant Command and International Wargames, conceptual planning, visualizations, training/orientation, M&S demonstrations, and the Warfighter's Modification & Fielding Requirements List (MFRL) for exercises and training - Implement I-SIM architecture requirements and emerging capability requirements to adapt to growing distributed event requirements - Sustain the Missile Defense Space Warning Tool (MDST) and related tools to pace fielded Overhead Persistent Infrared (OPIR) Architectures in support of Warfighter training and exercise events, and Element development engineering - Provide software operations/maintenance support to the Extended Air Defense Simulation (EADSIM) code base for use in Warfighter exercises, training venues, and Combatant Command planning tools - Upgrade models and develop new designs or software as required to support System simulations - Provide threat representations (trajectories, radar cross sections, and signatures data) for use in real-world events, simulations, exercises, wargames, and test and evaluation activities across the DoD - Develop products that meet digital and HWIL requirements and allow M&S participation across multiple intended uses Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD31 / *Modeling & Simulation*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- SEE ABOVE. ***FY 2022 Plans:*** - Update and provide new M&S capabilities to support development of Layered Homeland Defense (LHD): -- Develop signature, environment, and lethality models for layered defense, to include debris environment -- Adapt M&S framework and interfaces to accommodate new assets for LHD architecture -- Develop threat representations and provide threat data for LHD test, analysis, and assessment - Conduct M&S-level and element level engineering for LHD, including M&S planning, assessment, and requirements definition, and performing developmental integration activities ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides for M&S updates supporting Layered Homeland Defense activities.			
Title: M&S Objective Simulation Framework (OSF)	13.111	12.352	12.882
Articles:	-	-	-
Description: The following actions are required on a continuing basis to accomplish the OSF mission: - Develop and implement OSF upgrades to incorporate advanced tracking, discrimination, engagement and associated upper tier debris mitigation capabilities, as well as other requirements and capabilities to meet MDA's evolving M&S Enterprise needs - Perform testing and integration of Core Truth Model capabilities into the OSF framework - Sustain and enhance framework products to maintain capabilities to support stakeholders and to keep pace with the IMTP - Develop plans, procedures and documentation for scheduled events including Wargames and Combatant Command Exercises and the Distributed, Focused and Integrated HWIL Events as presented in the IMTP; provide event architecture integration and checkout of Wargames for these same IMTP scheduled events - Provide the integration expertise to meet the assessment requirements (includes the IMTP); support delivery of integrated architectures across all venues using the System test framework to integrate architectures - Develop, maintain, test, and field model representations for use in IMTP events and other MDA M&S stakeholder application areas; deploy hardware and software updates to distributed sites; perform regular maintenance and critical repairs of hardware and software - Maintain the M&S Integration and Development Laboratories for Element M&S; maintain venue for stakeholders to conduct early M&S integration efforts and identification of issues prior to event architecture integration to support system development - Continue maintenance of SSF in the required venues until the transition to OSF in the venues completes - Develop M&S products to keep pace with evolving requirements in all digital and test venues - Prototype, develop and deliver new OSF capabilities to support agency efforts in the Concept Evaluation and Developmental Engineering Intended Uses Specific and/or unique accomplishments to each FY are as follows:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD31 / *Modeling & Simulation*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
FY 2021 Plans: - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: M&S Core Truth Modeling	11.677	11.655	12.044
Articles:	-	-	-
Description: The Core Truth Model (CTM) program provides consistent and common Phenomenology, Lethality, Environment, Communications, and Threat models for M&S venues utilized in all digital and Ground Test events and wargaming exercises. The CTM efforts are critical in the assessment of all Missile Defense capability deliveries. The following actions are required on a continuing basis to accomplish the CTM mission: - Implement next generation truth representations for signatures and lethality to address advanced MDS capability needs for tracking, discrimination and engagement - Maintain legacy truth representations (e.g., Parametric Endoatmospheric-Exoatmospheric Lethality Simulation (PEELS), Kinetic Intercept Debris Distribution (KIDD) and Optical Signatures Code/Optical Signature Inline Generator (OSC/OPTISIG)) until fully transitioned - Support integration of all applicable CTM functions into the OSF framework - Provide support for scheduled events including training, exercises, Wargames, and the Distributed, Focused and Integrated HWIL Events as presented in the IMTP - Deliver CTM Toolkit for integrated truth representations across the M&S enterprise - Maintain an Environments Program that will provide consistent environment models for system and element level simulations - Continue development of Truth Interaction which includes infrared (IR) propagation and radio frequency (RF) propagation; this will provide consistent models and truth to system and element level simulations - Generate CTM Sensitivity analysis to identify the sensitivity within system simulation of Core Truth Models and boundary - Develop and maintain CTM design to support system and element level simulations across the entire M&S portfolio Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD31 / *Modeling & Simulation*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: M&S Improvements	35.074	59.397	36.447
Articles:	-	-	-
Description: This effort funds MDS Enterprise-wide M&S improvements that will enhance digital and ground test capabilities. Investigate improvements to the M&S program to support flight testing. Planned improvements include an experimental, developmental M&S prototype capability necessary to achieve a System-level integrated, high-fidelity end-to-end digital simulation. The prototype effort designs and develops a digital simulation capability that will provide assessment data, supplemental to Ground- and Flight tests, in areas that those venues cannot address. The End-to-end Digital Integrated System-level Simulation (EDISS) will eventually replace the current stand-alone approach to digital predictive pre-mission analysis. MDA is also implementing Ground Test Re-architecture to address accreditation and assessment limitations, increased Hardware-in-the-Loop (HWIL) complexity and reduced available integration times. The Ground Test Integrated System-level Simulation (GTISS) will make truth data consistent, implement standard framework interfaces, and provide common data formats to correct ground test simulation inadequacies in threat uncertainty as well as debris modeling. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - Continue development of initial delivery of EDISS, called Early Digital Product (EDP) -- Create cloud-computing and Data Analytics environment -- Prepare M&S for execution in support of Long Range Discrimination Radar (LRDR) assessment -- Complete requirements development -- Continue software development and conduct spiral In-Progress Reviews -- Conduct M&S Integration, Test, and Verification, Increment Acceptance Reviews - Continue Software Development of EDISS Full Digital Product (FDP), Increments 1 and 2: -- Complete systems engineering for FDP Inc 1, initiate systems engineering for FDP Inc 2, including System Requirements Review and System Functional Review -- Continue software development for FDP Inc 1, including Spiral In-Progress Reviews -- Conduct integration and testing for FDP Inc 1 - Deploy Phase 1 of GTISS (Ground Test Integrated System-level Simulation) improvements to the MDA Ground Test Architecture: -- Complete requirements development			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD31 / *Modeling & Simulation*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-- Continue software development -- Provide Threat Data Production improvements -- Conduct M&S Integration, Test, and Verification - Continue Engineering and Development of GTISS Phase 2: -- Continue software development, including in-progress technical reviews -- Integrate and Test GTISS phase 2 M&S - Perform GTISS Phase 3 Functional Analysis and System Design -- Conduct requirements analysis and functional analysis, develop system design -- Conduct Systems Engineering Technical Reviews			
FY 2022 Plans: - Continue Software Development of EDISS v2-4: -- Continue systems engineering for EDISS v3 -- Complete software development for EDISS v2, including Spiral In-Progress Reviews -- Continue integration and testing for EDISS v2 -- Perform M&S data production in support of Long Range Discrimination Radar (LRDR) assessment - Deploy Phase 2 of GTISS (Ground Test Integrated System-level Simulation) improvements to the MDA Ground Test Architecture: -- Complete requirements development -- Continue software development -- Provide Threat Data Production improvements -- Conduct M&S Integration, Test, and Verification - Continue Engineering and Development of GTISS Phase 3: -- Continue software development, including in-progress technical reviews -- Integrate and Test GTISS Phase 2 M&S - Perform post-GTISS Phase 3 sustainment planning			
FY 2021 to FY 2022 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD31 / *Modeling & Simulation*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Decrease from FY 2021 to FY 2022 reflects transition from development to implementation of the initial Enterprise digital M&S product.			
Accomplishments/Planned Programs Subtotals	82.344	107.710	87.068

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603881C: *Ballistic Missile Defense Terminal Defense Segment*	295.312	312.317	277.949	-	277.949	-	-	-	-	-	-
• 0603882C: *Ballistic Missile Defense Midcourse Defense Segment*	1,275.414	1,219.261	745.144	-	745.144	-	-	-	-	-	-
• 0603892C: *AEGIS BMD*	722.582	877.336	732.512	-	732.512	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The M&S acquisition strategy utilizes full and open competition to develop, acquire and deliver the integrated architectures/frameworks while the Elements, using the same open competition methods, develop and deliver models of their systems. The Digital and HWIL product centers integrate the suite of M&S into a composite simulation capability, all based on an open architecture. M&S achieves this end-state via close collaboration between its integrating contractor teams (Digital and HWIL) and those of the Element prime contractors, with additional technical standards and engineering oversight provided by FFRDCs and UARCs.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD31 / *Modeling & Simulation*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
M&S Requirements, Design Support, Scenario Optimization - FFRDC & UARC	MIPR	Various : CO, AL	8.334	1.458	Nov 2019	1.093	Nov 2020	0.618	Nov 2021	-		0.618	Continuing	Continuing	Continuing
M&S Requirements, Design Support, Scenario Optimization - Prior Yr Requirements & Scenario Design no longer funded in FYDP	Various	Various : AL	13.032	0.000		0.000		0.000		-		0.000	0.000	13.032	0.000
M&S Requirements, Design Support, Scenario Optimization - Requirements & Design - CSS	C/CPFF	TEAMS : CO, AL	28.542	5.861	Nov 2019	9.776	Nov 2020	9.177	Nov 2021	-		9.177	Continuing	Continuing	Continuing
M&S Requirements, Design Support, Scenario Optimization - Science and Technology Council	Various	Various : VA, AL	0.000	0.500	Dec 2019	0.000		0.000		-		0.000	0.000	0.500	0.000
M&S Requirements, Design Support, Scenario Optimization - Threat Modeling	Various	Various : CO, AL	0.000	3.544	Dec 2019	0.000		0.000		-		0.000	0.000	3.544	0.000
BMDS Simulations & Tools - Digital Framework Development	C/CPAF	Northrop Grumman : CO	34.671	0.000		0.000		0.000		-		0.000	0.000	34.671	0.000
BMDS Simulations & Tools - Digital Simulation Development / Support	MIPR	SMDC : AL	4.711	1.108	Dec 2019	1.750	Nov 2020	1.506	Nov 2021	-		1.506	Continuing	Continuing	Continuing
BMDS Simulations & Tools - Layered Homeland Defense M&S – Core Truth Model Toolkit	C/CPAF	DeciBel Research : AL	0.000	0.000		0.000		0.816	Jan 2022	-		0.816	Continuing	Continuing	Continuing
BMDS Simulations & Tools - Layered Homeland Defense M&S –	C/CPAF	Lockheed Martin : AL, CO	0.000	0.000		0.000		1.224	Jan 2022	-		1.224	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD31 / *Modeling & Simulation*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Framework and RepBox/ Tools															
BMDS Simulations & Tools - Layered Homeland Defense M&S – Threat Modeling and Production	C/CPAF	Northrop Grumman : CO	0.000	0.000		0.000		1.828	Jan 2022	-		1.828	Continuing	Continuing	Continuing
BMDS Simulations & Tools - Layered Homeland Defense M&S –Engineering and Integration	Various	Various : CO, AL	0.000	0.000		0.000		0.923	Jan 2022	-		0.923	Continuing	Continuing	Continuing
BMDS Simulations & Tools - M&S / Digital Framework Development	C/CPAF	SWDC : CO	0.000	8.144	Nov 2019	7.257	Nov 2020	9.302	Nov 2021	-		9.302	Continuing	Continuing	Continuing
BMDS Simulations & Tools - M&S / Digital Framework Support	Various	MDA : CO, AL	2.560	0.867	Nov 2019	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
BMDS Simulations & Tools - M&S / Digital Framework Support - CSS	C/CPFF	TEAMS : CO	6.494	0.000		1.963	Nov 2020	0.301	Nov 2021	-		0.301	Continuing	Continuing	Continuing
BMDS Simulations & Tools - M&S / Digital Framework Support - Industry	C/CPFF	TBE : AL	1.850	0.000		0.000		0.000		-		0.000	0.000	1.850	0.000
BMDS Simulations & Tools - M&S / Digital Framework Support - OGA	MIPR	CCDC : AL	16.459	0.000		0.000		0.000		-		0.000	0.000	16.459	0.000
BMDS Simulations & Tools - Science & Technology Council	Various	Various : VA, AL	0.000	1.000	Dec 2019	2.467	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing
M&S Objective Simulation Framework (OSF) - Continuous Integration Requirements Development	Various	Various : CO, AL	0.000	1.744	Dec 2019	2.088	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD31 / *Modeling & Simulation*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
M&S Objective Simulation Framework (OSF) - M&S HWIL - CSS	C/CPFF	TEAMS / Jacobs : CO, AL	5.626	2.708	Nov 2019	6.670	Nov 2020	6.874	Nov 2021	-		6.874	Continuing	Continuing	Continuing
M&S Objective Simulation Framework (OSF) - M&S HWIL - Industry	C/CPAF	Northrop Grumman : CO	6.540	0.000		0.000		0.000		-		0.000	0.000	6.540	0.000
M&S Objective Simulation Framework (OSF) - M&S HWIL Framework Development and Support	C/CPFF	MASC : AL, CO	39.312	1.663	Nov 2019	0.000		0.000		-		0.000	0.000	40.975	0.000
M&S Objective Simulation Framework (OSF) - M&S HWIL Simulations / Models - Various	Various	Various : CO, AL	0.000	2.426	Dec 2019	1.144	Dec 2020	1.475	Dec 2021	-		1.475	Continuing	Continuing	Continuing
M&S Objective Simulation Framework (OSF) - M&S HWIL Simulations / Models Development	MIPR	CCDC : AL	25.341	3.570	Nov 2019	2.450	Nov 2020	4.533	Nov 2021	-		4.533	Continuing	Continuing	Continuing
M&S Objective Simulation Framework (OSF) - M&S HWIL Support / GT re-architecture	Various	MDA : AL, CO	8.855	0.000		0.000		0.000		-		0.000	0.000	8.855	0.000
M&S Objective Simulation Framework (OSF) - Science & Technology Council	Various	Various : VA, AL	0.000	1.000	Dec 2019	0.000		0.000		-		0.000	0.000	1.000	0.000
M&S Core Truth Modeling - M&S Core Truth Modeling - OGA	MIPR	AFRL : CO	4.100	0.000		0.000		0.000		-		0.000	0.000	4.100	0.000
M&S Core Truth Modeling - Core Truth Modeling - Engineering	C/CPFF	PeopleTec : CO	0.000	4.282	Dec 2019	6.253	Nov 2020	5.876	Nov 2021	-		5.876	Continuing	Continuing	Continuing
M&S Core Truth Modeling - Core Truth Models Validation	Various	MDA : CO, AL	7.944	1.711	Nov 2019	0.700	Nov 2020	0.700	Nov 2021	-		0.700	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD31 / *Modeling & Simulation*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
M&S Core Truth Modeling - M&S Core Truth Modeling - CSS	C/CPFF	Peopletec : AL, CO	4.497	0.000		0.000		0.000		-		0.000	0.000	4.497	0.000
M&S Core Truth Modeling - M&S Core Truth Modeling - CSS 2	C/CPFF	TEAMS : AL, CO	1.683	0.000		0.000		0.000		-		0.000	0.000	1.683	0.000
M&S Core Truth Modeling - M&S Core Truth Modeling - Lethality/ Phenomenology Modeling	MIPR	CCDC : AL	34.822	0.000		0.000		0.000		-		0.000	0.000	34.822	0.000
M&S Core Truth Modeling - M&S Core Truth Modeling Simulation System	C/CPAF	Northrop Grumman : CO	50.706	0.000		0.000		0.000		-		0.000	0.000	50.706	0.000
M&S Core Truth Modeling - M&S Core Truth Modeling Simulation System 2	C/CPAF	SWDC : CO	0.000	5.684	Nov 2019	4.702	Nov 2020	5.468	Nov 2021	-		5.468	Continuing	Continuing	Continuing
M&S Improvements - Enterprise-wide ground test re-architecture improvements	Various	Various : CO, AL	10.650	10.219	Dec 2019	21.198	Dec 2020	12.145	Dec 2021	-		12.145	Continuing	Continuing	Continuing
M&S Improvements - M&S Improvement - Enterprise-wide digital capability development	Various	Various : CO, AL	30.355	24.855	Nov 2019	38.199	Nov 2020	24.302	Nov 2021	-		24.302	Continuing	Continuing	Continuing
		Subtotal	347.084	82.344		107.710		87.068		-		87.068	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	347.084	82.344		107.710		87.068		-		87.068	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD31 / *Modeling & Simulation*	

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.

Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD31 / *Modeling & Simulation*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
International Simulation v8.7	▲																											
Release Update to OSF - 4Q FY 2020				▲																								
International Simulation v8.8 - 1Q FY 2021					▲																							
MDST Update - FY 2021					▲																							
Initial GTISS Delivery						▲																						
Release Update to OSF - FY 2021							△																					
Release Update to OSF - FY 2022									△																			
International Simulation v8.9 - 1Q FY 2022									△																			
MDST Update - FY 2022									△																			
Early Digital Product										△																		
GTISS Update (2022)												△																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD31 / *Modeling & Simulation*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
International Simulation v8.7	1	2020	1	2020
Release Update to OSF - 4Q FY 2020	4	2020	4	2020
International Simulation v8.8 - 1Q FY 2021	1	2021	1	2021
MDST Update - FY 2021	1	2021	1	2021
Initial GTISS Delivery	2	2021	2	2021
Release Update to OSF - FY 2021	3	2021	3	2021
Release Update to OSF - FY 2022	1	2022	1	2022
International Simulation v8.9 - 1Q FY 2022	1	2022	1	2022
MDST Update - FY 2022	1	2022	1	2022
Early Digital Product	2	2022	2	2022
GTISS Update (2022)	4	2022	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MC31 / *Engineering Cyber Operations*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MC31: *Engineering Cyber Operations*	30.822	23.322	35.709	22.462	-	22.462	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2021 to FY 2022 reflects consolidation of Cyber Engineering activities within Systems Engineering processes.

A. Mission Description and Budget Item Justification

This project provides monitoring and tracking of Cybersecurity mitigations detailed in Information Technology security Plans of Activity and Milestones (POAMs). Activities include preparation of certification and accreditation documentation and accreditation recommendations to the MDA Senior Information Assurance Officer (SIAO)/Certification Authority (CA) and DAA. Independent Verification and Validation team actions ensure the availability, integrity, authentication, confidentiality and non-repudiation of the MDA mission, test and administrative systems. Activities in the Project are necessary to comply with the Federal Information Security Management Act.

This project implements Risk Management Framework (RMF) system engineering principles as specified within DOD 8510.01 to acquire, design, test, implement and field technical solutions throughout the systems architecture to ensure sufficient protections exist from a threat and risk based approach. MDA's goal is to ensure Cybersecurity engineering principles flow into system requirements and design specifications early to provide the most cost benefit and ensure security controls are aligned with the National Institute of Standards and Technology (NIST) 800-53a security controls as applicable to systems categorized as National Security Systems.

This project includes resources to conduct an MDA Insider threat program to identify, deter, and mitigate potential insider threats. This activity is Presidentially and DoD-mandated.

This project also funds MDA Cyber Assistance Teams to assess the security of MDA information on Defense Industrial Base networks.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Information Assurance / Cyber Network Defense	23.322	35.709	22.462
Articles:	-	-	-
Description: This activity includes network defense and Information System Security Manager (ISSM) activities for MDA Engineering. Specific tasks include: - Conduct Cybersecurity/information assurance engineering and architecture planning for Engineering information technology systems - Plan and test the information assurance controls for Engineering systems - Implement RMF system engineering principles to ensure sufficient protections exist from a threat and risk based approach			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MC31 / *Engineering Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Conduct Controls Validation Testing of systems and provide Plan of Action and Milestones to mitigate information assurance deficiencies - Conduct annual information assurance reviews to assess compliance in implementing and maintaining information assurance controls - Perform cybersecurity upgrades as needed to MDA Engineering systems to be in compliance with DoD mandates - Continue MDA Insider Threat Mitigation Team efforts - Implement and conduct continuous monitoring to determine continued security clearance eligibility - Perform engagements with MDA Defense Industrial Base (DIB) partners to detect and increase understanding of cyber threats Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - Provide full funding for Cyber Assistance Teams - Perform on-site visits of MDA Defense Industrial Base (DIB) partners to detect and increase understanding of cyber threats - Conduct Cyber Engineering to provide System-level analysis, cyber assessments, Adversarial Assessments, and Cyber Vulnerability Penetration Assessments (CVPAs) to support cybersecurity of BMD components ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects consolidation of Cyber Engineering activities within Systems Engineering processes.			
Accomplishments/Planned Programs Subtotals	23.322	35.709	22.462

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0305103C: *Cyber Security Initiative*	11.109	1.148	1.142	-	1.142	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

This project leverages expertise in the Engineering, intelligence/counterintelligence, and information assurance communities, including the Military Services, Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Centers (UARCs), and industry. The executing agents utilize various contracting strategies in a flexible manner to maximize their contribution. Products and Services will be acquired by competitive means to the extent that is beneficial and practical.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MC31 / *Engineering Cyber Operations*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Information Assurance / Cyber Network Defense - Cyber Assistance Team Leads	MIPR	MITRE : VA, AL	2.769	1.000	Nov 2019	2.490	Nov 2020	1.969	Nov 2021	-		1.969	Continuing	Continuing	Continuing
Information Assurance / Cyber Network Defense - Cyber Assistance Teams - Contractor Support	C/CPFF	TEAMS : VA, AL	8.168	3.860	Nov 2019	9.240	Nov 2020	9.559	Nov 2021	-		9.559	Continuing	Continuing	Continuing
Information Assurance / Cyber Network Defense - Cyber Assistance Teams - Hardware	Various	Various : VA, AL	1.692	1.184	Nov 2019	1.545	Nov 2020	1.576	Nov 2021	-		1.576	Continuing	Continuing	Continuing
Information Assurance / Cyber Network Defense - Cyber Assistance Teams - Intelligence Reporting	C/CPAF	Deloitte : AL, VA	3.178	0.000		2.215	Nov 2020	0.514	Nov 2021	-		0.514	Continuing	Continuing	Continuing
Information Assurance / Cyber Network Defense - Cyber Assistance Teams - Software/Licenses	C/CPAF	Splunk : AL, VA	2.401	0.000		2.040	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Information Assurance / Cyber Network Defense - Cyber Engineering	C/CPFF	Deloitte : AL, VA	0.000	6.198	Feb 2020	6.028	Dec 2020	1.071	Dec 2021	-		1.071	Continuing	Continuing	Continuing
Information Assurance / Cyber Network Defense - Cyber Engineering - CSS	C/CPFF	TEAMS : VA, AL	0.000	2.600	Feb 2020	2.546	Nov 2020	0.273	Dec 2021	-		0.273	Continuing	Continuing	Continuing
Information Assurance / Cyber Network Defense - Cyber Engineering - VISUM	MIPR	Various : AL	0.000	2.960	Feb 2020	2.961	Dec 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Information Assurance / Cyber Network Defense - Cyber Program Protection	C/CPFF	TEAMS : CO, AL, VA	0.000	0.000		0.000		1.285	Nov 2021	-		1.285	Continuing	Continuing	Continuing
Information Assurance / Cyber Network Defense - IT / CND Support	C/CPFF	TEAMS : CO, AL, VA	4.456	2.220	Nov 2019	1.634	Nov 2020	1.667	Nov 2021	-		1.667	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MC31 / *Engineering Cyber Operations*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Information Assurance / Cyber Network Defense - Insider Threat - Continuous SSO Support	C/CPFF	TEAMS : CO, AL, VA	0.000	0.000		1.124	Dec 2020	1.428	Dec 2021	-		1.428	Continuing	Continuing	Continuing
Information Assurance / Cyber Network Defense - Insider Threat Mitigation Cell	C/CPFF	TEAMS : CO, AL, VA	2.491	0.880	Dec 2019	1.398	Dec 2020	1.428	Dec 2021	-		1.428	Continuing	Continuing	Continuing
Information Assurance / Cyber Network Defense - Insider Threat Mitigation Cell - IT	C/CPAF	Northrop Grumman : CO	2.910	0.520	Dec 2019	0.531	Dec 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Information Assurance / Cyber Network Defense - Software Assurance	C/CPFF	TEAMS : CO, AL	2.757	1.900	Nov 2019	1.957	Nov 2020	1.692	Dec 2021	-		1.692	Continuing	Continuing	Continuing
		Subtotal	30.822	23.322		35.709		22.462		-		22.462	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	30.822	23.322		35.709		22.462		-		22.462	Continuing	Continuing	N/A

Remarks

Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MC31 / *Engineering Cyber Operations*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
Engineering Cyber Operations	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MC31 / *Engineering Cyber Operations*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Engineering Cyber Operations	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD32 / *Quality, Safety, and Mission Assurance*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD32: *Quality, Safety, and Mission Assurance*	294.540	29.780	30.269	29.527	-	29.527	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

Quality, Safety, and Mission Assurance ensures that the Missile Defense System (MDS) and all of its elements are designed, tested and operated in a reliable, safe, and effective manner.

Quality and Mission Assurance: Responsible for ensuring the reliable and effective design, test and operation of the MDS and all of its elements. Develops and ensures implementation of quality and mission assurance requirements. Mitigates quality and mission assurance risks to the lowest practical level. Provides in-plant MDA Assurance Representatives (MARs) at MDA government and contractor facilities to provide quality and mission assurance oversight of contractor manufacturing and integration. Performs Quality and Mission Assurance Assessments to ensure contractual requirements, internal requirements, and industry best practices are implemented at prime contractor and lower tier suppliers. Reviews and approves all new and modified parts, materials and critical processes for MDS elements.

Safety: Responsible for ensuring the safe design, test and operation of the MDS and all of its elements. Develops and ensures implementation of safety requirements. Mitigates safety risks to the lowest practical level. Ensures a safe workplace for all MDA employees and contractors by implementing a Safety program. MDS Safety Officers provide on-site support at the Missile Defense Integration and Operations Center (MDIOC) 24 hours a day, 7 days a week, 365 days a year to ensure operational safety of the MDS.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Quality, Safety & Mission Assurance	29.780	30.269	29.527
Articles:	-	-	-
Description: Quality, Safety, and Mission Assurance ensures that the Missile Defense System and all of its elements are designed, tested and operated in a reliable, safe, and effective manner. Specific and/or unique accomplishments to each FY are as follows:			
FY 2021 Plans: -SEE ABOVE.			
FY 2022 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD32 / *Quality, Safety, and Mission Assurance*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	29.780	30.269	29.527

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Quality, Safety and Mission Assurance program is a collaboration between subject matter expertise in the Government, Federally Funded Research and Development Centers (FFRDC), University Affiliated Research Centers (UARC), Contract Support Services (CSS), and Industry.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD32 / *Quality, Safety, and Mission Assurance*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Quality, Safety & Mission Assurance - Audits & Quality On-site Support	MIPR	NSWC Corona : AL, CA	27.226	3.500	Nov 2019	3.925	Nov 2020	2.921	Nov 2021	-		2.921	Continuing	Continuing	Continuing
Quality, Safety & Mission Assurance - In-Plant Quality Support (MARS)	C/CPFF	Various Multi : AL, AK, AZ, CA, CO, FL, HI, NJ, MA, MO, MD, UT	16.538	1.600	Nov 2019	0.000		0.000		-		0.000	0.000	18.138	0.000
Quality, Safety & Mission Assurance - Independent Readiness Review Team	C/CPFF	AI Solutions : AL	5.794	0.200	Nov 2019	0.000		0.000		-		0.000	0.000	5.994	0.000
Quality, Safety & Mission Assurance - MDS Quality Support	C/CPFF	AI Solutions : AL	11.337	0.800	Nov 2019	0.000		0.000		-		0.000	0.000	12.137	0.000
Quality, Safety & Mission Assurance - MDS Safety	C/CPFF	APT, INC : AL	12.516	0.600	Nov 2019	0.000		0.000		-		0.000	0.000	13.116	0.000
Quality, Safety & Mission Assurance - MDS Safety Officers	MIPR	CCDC : AL	4.614	0.092	Nov 2019	0.000		0.000		-		0.000	0.000	4.706	0.000
Quality, Safety & Mission Assurance - Management and Operations Support	MIPR	CCDC : AL	3.266	0.222	Nov 2019	0.639	Nov 2020	0.666	Nov 2021	-		0.666	Continuing	Continuing	Continuing
Quality, Safety & Mission Assurance - Mission Assurance Subject Matter Experts	C/CPFF	APT, INC. : AL	8.583	0.500	Nov 2019	0.000		0.000		-		0.000	0.000	9.083	0.000
Quality, Safety & Mission Assurance - Operations Support	MIPR	Various Multi : AL, CA	5.659	0.200	Nov 2019	0.000		0.000		-		0.000	0.000	5.859	0.000
Quality, Safety & Mission Assurance - Parts, Materials and Processes (PMP) Program	MIPR	Various Multi : AL, CA, DC, IN	17.650	2.094	Nov 2019	1.097	Nov 2020	1.308	Nov 2021	-		1.308	Continuing	Continuing	Continuing
Quality, Safety & Mission Assurance - Parts,	C/CPFF	AI Solutions : AL	8.417	1.666	Nov 2019	0.000		0.000		-		0.000	0.000	10.083	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD32 / *Quality, Safety, and Mission Assurance*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Materials and Processes - PMP - Program															
Quality, Safety & Mission Assurance - Pedigree & Design Certification - FFRDC	MIPR	Aerospace : AL, CA	29.058	3.000	Nov 2019	2.376	Nov 2020	2.748	Nov 2021	-		2.748	Continuing	Continuing	Continuing
Quality, Safety & Mission Assurance - Quality and Mission Assurance Support	C/CPFF	AI Solutions : AL, AK, AZ, CA, CO, FL, HI, NJ, MA, MO, MD, UT	10.371	0.750	Nov 2019	7.297	Nov 2020	5.872	Nov 2021	-		5.872	Continuing	Continuing	Continuing
Quality, Safety & Mission Assurance - Safety Support	C/CPFF	APT, Inc : AL, VA	3.014	0.220	Nov 2019	0.902	Jan 2021	1.018	Jan 2022	-		1.018	Continuing	Continuing	Continuing
		Subtotal	164.043	15.444		16.236		14.533		-		14.533	Continuing	Continuing	N/A

Remarks

N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Quality, Safety & Mission Assurance - Quality, Safety & Mission Assurance HQ & Core Management (MDA CIV)	Allot	MDA QS : AL, VA, MD, CA, AZ, HI, AK, MA, NJ, FL, AR, UT	99.848	11.836	Oct 2019	12.073	Oct 2020	14.189	Oct 2021	-		14.189	Continuing	Continuing	Continuing
Quality, Safety & Mission Assurance - Quality, Safety & Mission Assurance Operations Support	C/CPFF	Network Mgmt Resources Yorktown : AL and VA	12.777	1.500	Nov 2019	0.880	Dec 2020	0.280	Nov 2021	-		0.280	Continuing	Continuing	Continuing
Quality, Safety & Mission Assurance - Quality,	Allot	MDA QS : AL, CO, AK, DC, VA	17.872	1.000	Nov 2019	1.080	Oct 2020	0.525	Oct 2021	-		0.525	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD32 / *Quality, Safety, and Mission Assurance*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Safety & Mission Assurance Operations Support (Travel/PCS)															
		Subtotal	130.497	14.336		14.033		14.994		-		14.994	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	294.540	29.780		30.269		29.527		-		29.527	Continuing	Continuing	N/A

Remarks

Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD32 / *Quality, Safety, and Mission Assurance*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD32 Quality, Safety, and Mission Assurance	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD32 / *Quality, Safety, and Mission Assurance*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD32 Quality, Safety, and Mission Assurance	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD40 / *Program-Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program-Wide Support*	184.262	23.635	23.808	23.102	-	23.102	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	23.635	23.808	23.102
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD40 / *Program-Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	23.635	23.808	23.102

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD40 / *Program-Wide Support*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Facilities and Maintenance	MIPR	Various Multi: : AL, CO, CA, VA	27.831	0.000		2.157	Dec 2020	0.000		-		0.000	0.000	29.988	0.000
Program Wide Support - Agency Operations Management	Various	Various : Multi: AL, CA, CO, VA	6.156	0.356	Jul 2020	0.000		0.000		-		0.000	0.000	6.512	0.000
Program Wide Support - Agency Operations and Support Civilian Salaries, Travel, Training	Various	MDA : AK, AL, CA, CO, VA	32.108	16.085	Oct 2019	16.000	Oct 2020	17.624	Oct 2021	-		17.624	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Other Agency Services	MIPR	Various : Multi: AK, AL, CO, CA, HI, MD, VA, NJ, NY, OCONUS	0.000	5.442	Nov 2019	3.077	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/Various	Various : Multi: AK, AL, CO, CA, HI, MD, VA	112.565	0.000		2.574	Dec 2020	5.427	Dec 2021	-		5.427	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations, Sustainment and GPC	C/CPFF	Various Multi: : AK, AL, CA, HI, NY, VA	0.000	0.000		0.000		0.018	Nov 2021	-		0.018	Continuing	Continuing	Continuing
Program Wide Support - Facilities and Maintenance SRM	MIPR	Various : Multi: AL, CA, AL, AK	0.000	1.752	May 2020	0.000		0.033	May 2022	-		0.033	Continuing	Continuing	Continuing
Program Wide Support - Prior year no longer funded in the FYDP	Various	Various : Various	5.602	0.000		0.000		0.000		-		0.000	0.000	5.602	0.000
		Subtotal	184.262	23.635		23.808		23.102		-		23.102	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	184.262	23.635		23.808		23.102		-		23.102	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603890C / *BMD Enabling Programs*	Project (Number/Name) MD40 / *Program-Wide Support*	

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603890C / *BMD Enabling Programs*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 0603891C *I Special Programs - MDA*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	2,545.188	504.031	390.216	413.374	-	413.374	-	-	-	-	-	-
MD27: *Special Programs*	2,545.188	504.031	390.216	413.374	-	413.374	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

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.

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.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	512.098	420.216	448.064	-	448.064
Current President's Budget	504.031	390.216	413.374	-	413.374
Total Adjustments	-8.067	-30.000	-34.690	-	-34.690
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-30.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-7.941	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	-0.126	0.000	-34.690	-	-34.690

Change Summary Explanation

Further details are reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

THIS PAGE INTENTIONALLY LEFT BLANK

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 0603892C / *AEGIS BMD*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	4,234.517	722.582	877.336	732.512	-	732.512	-	-	-	-	-	-
MD09: *Aegis BMD*	3,034.373	285.313	361.441	437.453	-	437.453	-	-	-	-	-	-
MM09: *Aegis BMD SM-3 Development*	302.386	243.194	307.970	124.708	-	124.708	-	-	-	-	-	-
MC09: *Cyber Operations*	20.949	16.455	29.392	3.750	-	3.750	-	-	-	-	-	-
MX09: *Aegis BMD Development Support*	527.151	151.772	148.030	136.506	-	136.506	-	-	-	-	-	-
MD40: *Program-Wide Support*	349.658	25.848	30.503	30.095	-	30.095	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

Decrease from FY 2021 to FY 2022 reflects the reduction of development activities including the Guidance Electronics Unit(GEU) Engineering Change Proposal(ECP)and Software Upgrade (SWUP) build 8 and incorporation into the production line; completion of the Ballistic Missile Defense (BMD) 4.2 major development functionality and the BMD 5.1.3 Capability upgrade

A. Mission Description and Budget Item Justification

The Sea-Based Weapon Systems mission is to deliver an enduring, operationally effective and supportable BMD capability to defend the nation, deployed forces, friends and allies, and to increase this capability by delivering evolutionary improvements as part of Missile Defense System (MDS) upgrades. The Sea-Based Weapon Systems element of the MDS capitalizes upon and evolves from the existing United States Navy Aegis Weapons System (AWS) and Standard Missile (SM) infrastructures. Sea-Based Weapon Systems provides a forward-deployable, mobile capability to detect and track Ballistic Missiles of all ranges, and the ability to destroy Short-Range Ballistic Missiles (SRBMs), Medium-Range Ballistic Missiles (MRBMs), and Intermediate-Range Ballistic Missiles (IRBMs) in the midcourse phase of flight, and shorter range missiles in the terminal phase of flight. Sea-Based Weapon Systems also provides a Long Range Surveillance and Track (LRS&T) capability to the MDS. Upgrades to both the Aegis BMD Weapon System and the SM-3 configuration enable Sea-Based Weapon Systems to provide effective, supportable defensive capability against longer range, threats and an enduring Aegis Ashore defensive capability.

This Program Element includes MDS threat discrimination improvements, which will enhance MDS effectiveness against the evolving adversary threat. The result will be a MDS architecture more capable of discriminating and destroying reentry vehicles with a higher degree of confidence, improving Warfighter shot doctrine, and more efficiently using interceptor inventory. MDS threat discrimination improvements are funded from the Enabling (0603890C), Midcourse (0603882C), BMD Sensors (0603884C), Command and Control, Battle Management, and Communications (C2BMC)(0603896C), and Aegis BMD (0603892C) PEs.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0603892C *I AEGIS BMD*

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	737.269	814.936	674.825	-	674.825
Current President's Budget	722.582	877.336	732.512	-	732.512
Total Adjustments	-14.687	62.400	57.687	-	57.687
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-43.600			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	106.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-13.078	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	-1.609	0.000	57.687	-	57.687

Change Summary Explanation

Net increase in FY 2021 provides a Congressional add for SM-3 Block IIA Engineering Change Proposal (ECPs) and reflects Congressional reductions for Aegis Underlay and excess growth.

Increase in FY 2022 provides for SM-3 Block IB Threat Upgrade (TU)/Technology Refresh (TR) to modernize the Advance Signal Processor (ASP) and mitigate obsolescence issues; re-phasing from FY 2023 to align with updated cost estimates for Builds 8.2 and 8.3 completions which includes associated new threats and completes the Missile Power Application Non-Launch (MPAN) capability insertion and the integration of the threats captured in Sea Based Terminal (SBT) Increment II Capability Upgrade (CU); AWS and SM-3 Block IIA software upgrades for increased capability against expanded threat/mission space and increase performance for persistent deployment in support of Layered Homeland Defense. Increase also provides integration activities to meet planned demonstration objectives for a transportable deployment option.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / *AEGIS BMD*	Project (Number/Name) MD09 / *Aegis BMD*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD09: *Aegis BMD*	3,034.373	285.313	361.441	437.453	-	437.453	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Increase from FY 2021 to FY 2022 provides concepts, system-level requirements and preliminary design for methods to achieve persistent deployment in support of Layered Homeland Defense and the transition of:
- RF Links Improvements Accomplishment from Budget Project MC09 - Cyber Operations;
- Missile Cyber activities from Network/System Certification and Accreditation (C&A) to Budget Project MM09; and
- Weapon Systems Cyber activities from the Network/System C&A Accomplishment to Budget Project MD09, Aegis BMD 6.X Accomplishment.

A. Mission Description and Budget Item Justification

Sea-Based Weapon Systems continues development of a Sea-Based BMD capability in support of the MDA's mission to protect the homeland, deployed forces, friends and allies from ballistic missile threats of all ranges and in all stages of flight.

Systems Engineering & Integration performs requirements development, engineering analysis, capability integration, and performance verification for Aegis BMD development and MDS integration.

Aegis BMD Technology Design and Insertion enables cross-baseline specification management and capability assessments to ensure consistent application of technical standards, processes, and procedures across the Aegis BMD program. Aegis BMD specific efforts include: systems engineering and architecture (process and execution); modeling and simulation (M&S); Verification and Validation (V&V) test and evaluation support; ship integration; quality; safety and mission assurance M&S. V&V efforts in this accomplishment are performed at the Aegis BMD element level, which feed into the overall MDS system level.

Aegis Baseline (BL) 5.4.0 (BMD 4.1.2) is a joint effort with the U.S. Navy developing a single Aegis Weapon System that merges BMD 4.1 and Aegis BL 5.3 computer programs within the current BMD 4.x weapon system architecture. Additional capabilities provide Anti-Air Warfare (AAW) improvements, SM-6 Dual I Extended Range AAW/Anti-Surface Warfare (ASUW), interoperability improvements, and updated BMD threat adaptation data.

Aegis BL 5.4.1 (BMD 4.2) is a joint effort with the U.S. Navy that refurbishes existing ship AN/SPY-1 radar arrays with the installation of antenna Low Noise Amplifiers (LNAs). This baseline will provide update to 21 Flight I/II Destroyers (DDG) with increased capability to maintain relevance through End of Service Life. Capabilities delivered include discrimination improvements, expanded threat set, increased stand-off range, expanded ship operating area, and war fighter requested improvements.

Aegis BL 9 (BMD 5.1.3, BMD 5.1.4, BMD 5.1.5, BMD 5.1.6 Software Spiral development) aligns with U.S. Navy Aegis Baseline 9 Capability Packages 2021, 2022, 2023, and 2024 respectively. The software spirals provide enhanced detection, track, report, and defeat capabilities of additional intermediate range threats with increasingly complex engagement scenes and increased raid sizes. Through a series of unique Capability Insertion Packages, BMD 5.X capability spirals provides continuous

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

software updates to the original BMD 5.1.0 architecture to incorporate emerging MDS capabilities, War fighter improvements, SM-3 software updates, and improved Weapon System performance necessary to pace the threat.

Aegis BL 10 (BMD 6.0) incorporates the solid state Air and Missile Defense Radar (AMDR), now designated AN/SPY-6(v)1, for introduction on the first Flight III DDG. Aegis BL 10 (BMD 6.0) will provide deployed assets enhanced Integrated Air and Missile Defense (IAMD) capability, while enabling MDS element utilization of SPY-6 data for remote engagement. Enhancements include significant improvements in IAMD planning, search, track, discrimination and force level (multi-asset) raid defense. Aegis BL 10 (BMD 6.0) will enable U.S. Navy ships to maintain greater stand-off range while increasing performance against complex threats.

Aegis Layered Homeland Defense includes Aegis Weapon System and SM-3 Block IIA software modifications to existing systems to support a phased delivery of operational capability against expanded threat/mission space.

M&S Objective Simulation Framework (OSF) effort develops, maintains and deploys the framework hardware and software for use at element laboratories and Combatant Command (CCMD) locations to support Integrated Master Test Plan (IMTP) events, MDS capability delivery assessments, War fighter training, exercises, and wargames.

M&S MDS Simulations & Tools effort provides development and sustainment of digital products and the architecture framework, and delivery/maintenance of infrastructure for MDS performance assessments.

MDS System Assessment and Verification, Validation & Assessment (VV&A) includes activities to support MDS Operational Capacity Baseline (OCB) delivery decisions and Technical Capability Declarations (TCDs), and anchor System M&S.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Systems Engineering & Integration	20.417	18.999	19.721
Articles:	-	-	-
Description: Perform requirements development, engineering analysis, capability integration, and performance verification for Aegis BMD development and MDS integration, including Aegis BMD compliance with the MDS Specification and MDS Description Document. Recurring Accomplishments: - Conduct system level performance analyses to support ongoing MDS Architecture and Systems Engineering efforts - Perform top-down system level engineering analysis, capability integration, and performance verification for Aegis BMD development and MDS integration, including Aegis BMD compliance with the MDS System Specification and MDS System Description Document - Identify architecture alternatives that improve the MDS System's performance and are complementary to and interoperable with NATO systems and theaters around the world - Define MDS technical content expectations and develop system requirements, to include integration of new capabilities, such as the U.S. Navy's AMDR			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Develop functional performance, interface, and design suitability requirements in collaboration with Aegis BMD engineers to ensure correct flow-down and allocation of MDS System-level requirements to Aegis BMD - Respond to Warfighter, Combatant Command and other requests for analyses and requests for information; provide analytical support for real-world events - Conduct non-advocate assessments of MDS capabilities and limitations prior to capability delivery decisions to determine fielding readiness (including Theater/Regional BMD) - Conduct extensive analysis of data collected in MDS test events to evaluate MDS System operations and performance Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion	46.919	56.567	46.290
Articles:	-	-	-
Description: Aegis BMD Core System Engineering enables cross-baseline specification management and capability assessments to ensure consistent application of technical standards, processes, and procedures across the Aegis BMD program. Aegis BMD specific efforts include: systems engineering and architecture (process and execution), M&S, V&V, test and evaluation support, and ship integration. M&S V&V efforts in this accomplishment are performed at the Aegis BMD element level, which feed into the overall MDS system level. Recurring Accomplishments: - Conduct U.S. Navy and Joint Link certifications required for Baseline certifications for operational deployment - Support Ground Test Campaign for MDS to achieve OCB declaration - Execute V&V activities and provide results to MDA System Verification Team and the Operational Test Agency (OTA) in support of System-level accreditation for BMDS events - Provide M&S Requirements Management and Development - Conduct further development of Aegis BMD System Architecture and overarching system concepts - Conduct MDS system level requirements allocation and Aegis BMD system requirements development, trace, validation and verification, and configuration management for coordination with all participating external agencies and organizations - Perform Command, Control, Computer, Communications and Intelligence (C4I) systems engineering to further develop Aegis BMD requirements, and to identify and resolve MDS interoperability issues			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Define and coordinate development and implementation of C4I capabilities in U.S. Navy C4I programs of record to meet Aegis BMD requirements - Conduct Threat Engineering analysis and Requirements Assessment - Conduct Systems Engineering for Aegis BMD system-level M&S development and interfaces to the MDS architecture - Provide verified, validated, accredited models in support of U.S. Navy certification, MDA characterization of system-level performance, OTA assessment of operational capabilities, and representation of Aegis BMD capabilities in MDS test and exercise venues - Provide target engineering, test planning activities, and IMTP process/inputs for Aegis BMD - Conduct Performance Assessment and Verification (PAV) processes which assess the sufficiency of Objective Quality Evidence (OQE) to provide a traceable evidence to verify Element Specification (ES) requirements traced to MDS requirements - Provide oversight of all Aegis BMD analysis in support of systems assessment and verification supporting test and analysis requirements and test planning inputs to align with MDA and U.S. Navy test programs - Provide consolidated analysis and reporting for firing events Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - Provide Electronic Protection analysis - Develop and mature Regional Sensor Advanced Discrimination solutions and M&S updates for multiple Aegis BMD architectures - Provide Software Development of End-to-end Digital Integrated System-level Simulation (EDISS) Full Digital Product (FDP), Increments 1 and 2 - Complete systems engineering for FDP Inc 1, initiate systems engineering for FDP Inc 2, including System Requirements Review and System Functional Review - Provide software development for FDP Inc 1, including Spiral In-Progress Reviews - Conduct integration and testing for FDP Inc 1 - Deploy Phase 1 of Ground Test Integrated System-level Simulation (GTISS) improvements to the MDA Ground Test Architecture to address BMDS Operational Test Agency (OTA) identified issues - Provide software development of GTISS Phase 2, including in-progress technical reviews - Integrate and test GTISS Phase 2 M&S - Conduct requirements and functional analysis for GTISS Phase 3 - Conduct Systems Engineering Technical Reviews and develop GTISS Phase 3 system design ***FY 2022 Plans:*** - Implement Interface Change Proposals (ICPs) into Command and Control Processor (C2P) - Perform Independent Verification and Validation (IV&V) of ICPs into C2P - Implementation of ICPs supporting Army Integrated Battle Command System (IBCS) and C2BMC integration			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Execute Aegis BMD feasibility analysis in support of MDS future architecture strategies and War fighter needs - Transition feasible weapon system improvements into Baseline development efforts - Continue to transition mature Regional Sensor Advanced Discrimination solutions and M&S into Baseline development efforts - Execute analysis and concept exploration to meet the MDS discrimination needs and objectives - Execute a System Requirements Review (SRR) for BMD 6.0.1. BMD 6.0.1 is planned to update the BMD 6.0 to meet Ballistic Missile Defense System Support (BMDSS) requirements beyond Increment 8 - Complete verification analysis and Objective Quality Evidence for OCB report out of Aegis BMD 5.1.4 - Execute a System Requirements Review (SRR) for BMD 5.2.1. BMD 5.2.1 is an update to BMD 5.2 to meet MDS System Specification requirements through Increment 9. - Execute threat analysis to define Aegis BMD Element Specifications (ES) requirements to support MDS System Specification Defended Area (DA) and Integrated Engagement Plan (IEP) requirements. Task addresses existing MDS System Specification performance widows. - Execute threat analysis to support MDS Increment 9 and 10 advanced threats beyond current Aegis BMD threat space. - Expand automated test and verification capabilities, to include automated performance verification and SM-3 test and verification - Complete Final VV&A, test and Accreditation for EDISS Increment 2 - Complete element design, development, requirements and system functional analysis, and system integration, test and VV&A for EDISS Increment 3 - Begin Requirements, element design, development, integration and System functional analysis for EDISS Increment 4 - Continue to Integrate and test GTISS Phase 2 M&S - Deploy Phase 2 of GTISS improvements to the MDA Ground Test Architecture to address MDS OTA identified issues - Provide engineering and software development of GTISS Phase 3, including in-progress technical reviews ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY2021 to FY2022 reflects a decrease in C4I integration efforts, discrimination and threat analysis, and requirements development across Aegis Baselines and SM-3 Variants.			
Title: Aegis BMD 4.x Development	63.357	74.195	56.713
Articles:	-	-	-
Description: Aegis Baseline 5.4.0 (BMD 4.1.2) incorporates the BMD 5.0 Capability Upgrade (CU) of European Phased Adaptive Approach (EPAA) Phase II ENDO/EXO requirements including EPAA Phase II Exo-atmospheric threats, integration of the SM-3 Block IB Threat Upgrade (TU), and reintroduction of other Aegis capabilities integrated with the SM-6 Dual I (Endo only). It provides Aegis Modernization capabilities comparable to the BMD 4.0 ships with legacy computer processing architecture. Aegis Baseline 5.4.1 (BMD 4.2) baseline development takes advantage of refurbished and upgraded AN/SPY-1 radar arrays with LNAs by increasing BMD capabilities with improved radar sensitivity, discrimination, threat upgrades, and more efficient radar resource utilization.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Recurring Accomplishments: - Update Critical Item Development (CIDS), Interface Description Specifications (IDS) and all supporting engineering documents and plans - Conduct design studies and concepts supporting development and integration - Conduct Aegis BMD performance analysis supporting In-Process Reviews (IPR) - Participate in program leadership and technical forums including Program Management Team, System Engineering Team, and Cross Product Teams for Integration and Test, M&S, Test, Evaluation & Certification, and Fleet Integration and Design - Provide Weapon System updates to include MIL-SPEC UYK-43, Commercial Off-The-Shelf (COTS) BMD Signal Processor, and COTS adjunct processor updates - MDA/Navy co-funded effort to provide BMD capability on Flight I/II DDGs Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** For Aegis Baseline 5.4.1 (BMD 4.2): - Perform computer program integration efforts, capability development and coding; unit test and element computer program integration and test; ET&E, and MEI&T with regression testing - Conduct two IPRs in FY 2021 - Conduct increased threat sensitivity runs in MEDUSA to account for new additional threats - Incorporate new baseline requirements as a result of an FY 2020 System Requirements Review (SRR) - Develop ship change documents supporting the Radar Array Face replacement ***FY 2022 Plans:*** For Aegis Baseline 5.4.1 (BMD 4.2): - Complete computer program integration efforts, capability development and coding; unit test and element computer program integration and test; and Engineering Test and Evaluation (ET&E), and Multi-Element Integration and Test (MEIT) with regression testing to support: - In-Process Review (IPR) #5 - AEGIS BL 5.4.1 Engineering Evaluation (EE) - AEGIS BL 5.4.1 (BMD 4.2) Engineering Assessment (EA) - Continue increased threat sensitivity runs in MEDUSA to account for new additional threats - Complete the incorporation of new baseline requirements as a result of an FY 2020 SRR - Conduct prototype install on first ship to finalize Ship Change Notice development in support of future ship installs in preparation of At-Sea testing and tracking event			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Conduct testing on first ship to test LNAs in a shipboard environment ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects completion of major development functionality and shifting focus to implementation and development testing at-sea.			
Title: Aegis BMD 5.x Development	15.914	51.682	46.165
Articles:	-	-	-
Description: In alignment with U.S. Navy Aegis Baseline 9 Capability Packages (CP)(2021, 2022, 2023, and 2024), Aegis BMD 5.X will develop a series of unique Capability Insertion Packages (CIP) that expand detection, track, report, and defeat capabilities of additional intermediate range threats with increasingly complex engagement scenes and increased raid sizes. Aegis BMD capability packages are focused towards Aegis Baseline 9 DDGs and Aegis Ashore Missile Defense Systems (AAMDS). Annual capability upgrades are necessary to pace the evolving threat, improve system reliability, and incorporate technological growth. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** Deliver Aegis BMD 5.1.3 (Aligned with Navy AEGIS Baseline 9 2021): CIP includes: - Missile Power Application Non-Launch (MPAN) Increment 1: Provides SM-3 Block IIA missile reprogramming capability in operational environment (Aligned with SM-3 Software Build 8.0/8.1) - Active Sensor Bias: Provides updates to improve radar tracking performance and report tracking bias to the Missile Defense System (MDS) - 5th Fleet Urgent Operational Need (UON): Incorporate additional threat systems in support of 5th Fleet UON Continue Aegis BMD 5.1.4 (Aligned with Navy Aegis Baseline 9 2022): CIP Includes: - Expanded Aegis BMD Threat Space: Provides integration of additional threats to the Aegis weapon system (aligns with SM-3 Block IIA Build 8.0/8.1 software updates and threat set) - Hypersonic TDL Upgrades: Incorporates two (2) TDL Interface Change Proposals (ICP) in support of BMDS Hypersonic track and reporting requirements - Electronic Attack/Electronic Protection (EA/EP) Increment 1: Provides initial weapon system improvements for operations in complex EA environments - MPAN Increment 2: Builds upon Increment 1 (BMD 5.1.3) by providing parallel processing and multi-cycle reprogramming, which decreases software update cycle times for the SM3 Block IIA missile - Aegis Ashore TI-12 Hybrid (TI-12H) Integration: Provides weapon system updates and integration of TI-12H architecture in Aegis Ashore Missile Defense Systems			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Doppler Data Collection System: Provides capability to collect Doppler data on RADAR tracks - 5th Fleet Urgent Operational Need (UON): Incorporate additional threat systems in support of 5th Fleet UON Commence Aegis BMD 5.1.5 (Aligned with Navy Aegis Baseline 9 2023): CIP Includes: - Expanded Hypersonic Track and Report (Increment 2): Continues development and delivery of Hypersonic tracking and reporting with MDS performance requirements - Expanded Aegis BMD Threat Space: Provides integration of additional threats to the Aegis weapon system (aligns with SM-3 Block IIA Build 8.2/8.3 software updates and threat set) - Aegis BMD Warfighter Improvements: Incorporates/Integrates Warfighter feedback through enhancements to existing functionality - Enhanced Aegis Data Link: Provides interface update between SPY-1 RADAR and SM3 missile - Aegis Remote Engagement (ARE): Integrates interface updates with the MDS to use additional remote data sources for Aegis BMD engagements Commence Aegis BMD 5.1.6 (Aligned with Navy Aegis Baseline 9 2024): CIP Includes: - Expanded Active Sensor Bias (Increment 2): Provides updates to improve radar tracking performance and report tracking bias across BMDS sensors for improved track quality - Increased Boost Phase Communications (9-State Plus): Provides additional position, velocity, and acceleration track covariance over the TDL for boosting track in support of the GMD mission - Expanded Aegis BMD Threat Space: Provides integration of additional threats to the Aegis weapon system (aligns with SM-3 Block IIA Build 9.0 software updates and threat set) - Aegis BMD Warfighter Improvements: Incorporates/Integrates Warfighter feedback through enhancements to existing functionality ***FY 2022 Plans:*** Deliver Aegis BMD 5.1.4 (Aligned with Navy Aegis Baseline 9 Capability Package 2022): CIP Includes: - Expanded Aegis BMD Threat Space: Provides integration of additional threats to the Aegis weapon system (aligns with SM-3 Block IIA Build 8.0/8.1 software updates and threat set) - Hypersonic TDL Upgrades: Incorporates two (2) TDL Interface Change Proposals (ICP) in support of BMDS Hypersonic track and reporting requirements - Electronic Attack/Electronic Protection (EA/EP) Increment 1: Provides initial weapon system improvements for operations in complex EA environments			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- MPAN Increment 2: Builds upon Increment 1 (BMD 5.1.3) by providing parallel processing and multi-cycle reprogramming, which decreases software update cycle times for the SM3 Block IIA missile - Aegis Ashore TI-12 Hybrid (TI-12H) Integration: Provides weapon system updates and integration of TI-12H architecture in Aegis Ashore Missile Defense Systems - Doppler Data Collection System: Provides capability to collect Doppler data on RADAR tracks - 5th Fleet Urgent Operational Need (UON): Incorporate additional threat systems in support of 5th Fleet UON Continue Aegis BMD 5.1.5 (Aligned with Navy Aegis Baseline 9 2023): CIP Includes: - Expanded Hypersonic Track and Report (Increment 2): Continues development and delivery of Hypersonic tracking and reporting with MDS performance requirements - Expanded Aegis BMD Threat Space: Provides integration of additional threats to the Aegis weapon system (aligns with SM-3 Block IIA Build 8.2/8.3 software updates and threat set) - Aegis BMD Warfighter Improvements: Incorporates/Integrates Warfighter feedback through enhancements to existing functionality - Enhanced Aegis Data Link: Provides interface update between SPY-1 RADAR and SM3 missile - Aegis Remote Engagement (ARE): Integrates interface updates with the MDS to use additional remote data sources for Aegis BMD engagements Continue Aegis BMD 5.1.6 (Aligned with Navy Aegis Baseline 9 2024): CIP Includes: - Full Active Sensor Bias (Increment 2): Provides updates to improve radar tracking performance and report tracking bias to the MDS - Increased Boost Phase Communications (9-State Plus): Provides additional position, velocity, and acceleration track covariance over the TDL for boosting track in support of the GMD mission - Expanded Aegis BMD Threat Space: Provides integration of additional threats to the Aegis weapon system (aligns with SM-3 Block IIA Build 9.0 software updates and threat set) - Aegis BMD Warfighter Improvements: Incorporates/Integrates Warfighter feedback through enhancements to existing functionality ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the completion of BMD 5.1.3 in FY 2021.			
Title: Aegis BMD 6.x Development	71.114	88.638	84.443
Articles:	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Description: The U.S. Navy is developing the Advance Capability Build (ACB) 20 Combat System (CS) and the AMDR, now designated SPY-6, for introduction on the first DDG Flight III. Aegis BMD 6.0 will integrate Aegis BMD 5.1 capability with the ACB 20 Combat System, to include new SPY-6 requirements. Aegis BMD 6.0 exploits SPY-6 radar improvement to enhance Engagement and Search and Track capabilities to include discrimination, raid defense and expanded threat space. This will enable BMDS element utilization of SPY-6 data for remote engagements and will supplement deployed assets with simultaneous multi-mission capabilities (e.g. IAMD). SPY-6 will support a force-level (multi-asset) approach to raid defense and will enable U.S. Navy ships to have a greater stand-off range from threat environments. Recurring Accomplishments: - Develop Critical Item Development (CIDS), Interface Description Specifications (IDS) and all supporting engineering documents and plans - Conduct design studies and concepts supporting development and integration - Conduct Aegis BMD performance analysis supporting In-Process Reviews(IPR) - Participate in program leadership and technical forums including Program Management Team, System Engineering Team, and Cross Product Teams for Integration and Test, M&S, Test, Evaluation & Certification, and Fleet Integration and Design - Develop computer program for Aegis BMD 6.0 supporting Software Increment Reviews (SWIR) - MDA/Navy co-funded effort to provide BMD capability on Flight III DDGs - Expanded BMD Tracking and reporting updates Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - Conduct Aegis BMD 6.0 concurrent engineering across Mission Planner (Polygon Defended Area/Launch Area/Weapons Doctrine & Real-Time Plan Response), IAMD/BMD Search & Track, Engagement Scheduling, Engagement Capacity, Raid and Dual Tier/Remote Engagement areas - Continue SPY-6 integration efforts, capability development, and performance analysis - Continue Aegis BMD 6.0 design, code, test and performance analysis across the BMD Mission area ***FY 2022 Plans:*** - Continue Aegis BMD 6.0 concurrent engineering across Mission Planner (Polygon Defended Area/Launch Area/Weapons Doctrine & Real-Time Plan Response), IAMD/BMD Search & Track, Engagement Scheduling, Engagement Capacity, Raid and Dual Tier/Remote Engagement areas - Continue SPY-6 integration efforts, capability development, and performance analysis with focus shifted to on-ship/at-sea - Continue Aegis BMD 6.0 design, code, test and performance analysis across the BMD Mission area with focus shifted to on-ship/at-sea - Conduct EA against BMD 6.0 capabilities			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Perform on-ship Aegis Light Off (ALO) and begin Sea Trials ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects continuation of major development functionality and shifting focus to implementation and development testing at-sea.			
Title: Aegis Layered Homeland Defense Development	9.595	12.469	98.963
Articles:	-	-	-
Description: Aegis Weapon System (AWS) and SM-3 Block IIA software modifications to existing systems to support a phased delivery of operational capability. The planned phased updates will build on the proven residual capability demonstrated in FTM-44 in CY 2020.The second phase of planned capability will increase system performance against moderate threats for Aegis BMD to provide an initial under layer capability to GMD in support of Homeland Defense. The third phase of planned capability will expanded threat/mission space and increase system performance against more complex threats to provide a robust under layer capability to GMD in support of Homeland Defense. In addition to increasing the performance capability of Aegis BMD, assess deployment options to include both transportable and persistent approaches. ***FY 2021 Plans:*** - Conduct analysis to inform system level requirements and implement an acquisition strategy to facilitate system development to expanded threat/mission space and increase system performance against moderate threats - Assess options and evaluate concepts for alternate SM-3 deployment methods to achieve both transportable and persistent deployment in support of Layered Homeland Defense, excluding any activities to increase system performance against moderate threats - Define concept and test plan for demonstration of transportable deployment concepts, utilizing the existing Aegis Weapon System fire control as point of departure, to complement existing MDS elements - Identify and resolve integration challenges ***FY 2022 Plans:*** - Refine system level requirements and facilitate system development to expanded threat/mission space and increase system performance against moderate threats - Conduct System Requirements Review - Execute design and implementation of Weapon System and Standard Missile (SM-3 Block IIA) software upgrades in support of the phased delivery of operational capability against expanded threat/mission space and increase system performance against moderate threats to provide an initial under layer capability to GMD in support of Homeland Defense - Refine concepts for alternate SM-3 deployment methods to achieve both transportable and persistent deployment in support of Global Regional Defense Operations and Layered Homeland Defense, excluding any activities to increase system performance against moderate threats			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Refine transportable deployment concept and execute design modifications to the following components: C2 component with Virtualized Aegis Weapon System (VAWS), Launcher component capable of firing SM-3 Block IIA and an Interceptor Communications component with antenna for in-flight uplink/downlink between VAWS and SM-3 Block IIA - Execute integration activities (e.g., communication antenna systems) required to meet planned demonstration objectives and resolve integration challenges of components - Continue to refine test plan for demonstration of transportable deployment concept - Conduct analysis addressing MDS Layered Homeland Defense Mid-term (FY2025-FY2029) Capability Evolution goals to include integrated battle management concepts and feasibility analysis for Aegis BMD system level performance - Conduct evaluation of enabling software and hardware technologies for both the AWS and the SM-3 in support of a future operational capability against expanded threat/mission space and increase system performance against more complex threats ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides AWS and SM-3 Block IIA software upgrades for increased capability against expanded threat/mission space and increase performance for persistent deployment in support of Layered Homeland Defense. Increase also provides integration activities to meet planned demonstration objectives for a transportable deployment option.			
Title: Modeling & Simulation Objective Simulation Framework	34.888	32.829	33.366
Articles:	-	-	-
Description: This effort develops, maintains and deploys the framework hardware and software for use at element laboratories and CCMD locations to support IMTP events, MDS capability delivery assessments, Warfighter training, exercises, and Wargames. Recurring Accomplishments: - Develop and implement OSF upgrades to incorporate advanced tracking, discrimination, engagement and associated upper tier debris mitigation capabilities, as well as other requirements and capabilities to meet MDA's evolving M&S Enterprise needs - Sustain and enhance framework products to maintain capabilities to support stakeholders - Develop plans, procedures and documentation for scheduled events including Wargames and Combatant Command Exercises and the Distributed, Focused and Integrated hardware in the loop (HWIL) Events as presented in the IMTP. Provide event architecture integration and checkout of Wargames for these same IMTP scheduled events - Provide the ground test architecture integration expertise to meet the testing requirements of the IMTP. Support delivery of integrated architectures for test across all test venues using the MDS test framework to integrate distributed architectures in support of MDS - Develop, maintain, test, field, and operate model representations for use in events and other MDA M&S stakeholder application areas. Deploy hardware and software updates to distributed sites. Perform regular maintenance and critical repairs of hardware and software.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Control and maintain the M&S Integration and Development Laboratories for Element M&S. Maintain venue for stakeholders to conduct early integration efforts and identification of issues prior to event architecture integration to support system development. - Continue maintenance of the Single Stimulation Framework in the required venues until the transition of the Objective Simulation Framework into the venues completes. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: M&S BMDS Simulations &Tools	4.460	4.543	4.455
Articles:	-	-	-
Description: This effort includes: development and sustainment of digital products and the architecture framework, and delivery/ maintenance of infrastructure for MDS performance assessments. Recurring Accomplishments: - Integrate, test, and verify the M&S enterprise supporting MDS testing, assessment, exercises, and wargaming, including testing infrastructure. Guide and facilitate integration testing of MDA's M&S frameworks and core truth models, and all M&S components into virtual representations of the MDS that are credible, affordable, and provide decision makers with the data needed - Integrate, test, functionally qualify, and deliver M&S tools and complex test architectures to provide system test capabilities to support MDA IMTP based test events, wargames, and exercises - Continue the transition of real-time digital simulation capability to the OSF to support Intended Uses - Provide HWIL/M&S Benchmarking/Integration documentation and coordination - Conduct M&S system integration and verification to support M&S system architecture development. Provide developmental integration testing to support M&S system architecture integration Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: BMDS Verification, Validation & Assessment (VV&A) ***Articles:*** ***Description:*** This activity includes MDS System Assessment and VV&A activities to support MDS OCB delivery decisions and TCDs, and anchor System modeling and simulation. Recurring Accomplishments: - Verify MDS performance, and produce MDS verification status reports - Conduct extensive analysis of data collected in MDS ground and flight test events, instrumental to understanding MDS System operations and performance and anchoring models and simulations - Identify mitigation approaches for MDS performance issues uncovered during system level analysis and assessment - Maintain M&S VV&A database, and verification data for MDS System Specification Change Notices - Develop, maintain, and update the M&S VV&A tool kit - Provide recommendations for improving assessment confidence, including M&S and testing issue resolutions - Conduct V&V in support of MDA MDS System level accreditation process in support of MDS Ground Test and performance assessment events - Conduct specified MDS System post-flight reconstructions, element post-flight reconstructions, and pre-mission testing events so as to optimize the body of evidence and analysis supporting system-level MDS accreditation. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - Conduct V&V of Aegis BMD digital models in support of accreditation process for MDS Ground Test and performance assessment events ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A	18.649 -	21.519 -	19.912 -
Title: RF Link Improvements ***Articles:*** ***Description:*** The U.S. Navy is pursuing improvements identified by Engineering Topic 17 (ET-17) within Aegis Baseline 10 development and specific missile type. Radio Frequency (RF) Link Security Improvements will advance communications between	0.000 -	0.000 -	27.425 -

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Aegis BMD Weapon System and SM-3 Block IB and IIA missile variants. Product development and implementation will enable missile hardware enhancements in order to achieve the full requisite Missile RF Link Security Improvements. ***FY 2021 Plans:*** N/A ***FY 2022 Plans:*** All efforts for this accomplishment have transitioned from Budget Project, MC09 Cyber Operations - Begin software development and hardware prototype efforts to include initial integration testing - Conduct analysis and design trades to define encryption scheme for the weapon system, including backwards compatibility with missiles without RF Link Security upgrades - Update Aegis BMD Weapon System requirements and interface specifications to incorporate changes between the weapon system and missile message link ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides for the transition of RF Links Improvements Accomplishment from Budget Project MC09 - Cyber Operations to MD09 to align with the Financial Management Regulation (FMR) definition of weapons system cyber activities.			
Accomplishments/Planned Programs Subtotals	285.313	361.441	437.453

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208866C: *MD09: Aegis BMD O&M*	74.642	79.913	68.293	-	68.293	-	-	-	-	-	-
• 0208866C: *MD09: Aegis BMD Procurement*	336.374	353.896	334.621	-	334.621	-	-	-	-	-	-
• 0208866C: *MD73: Aegis Ashore Procurement*	26.495	34.629	25.866	-	25.866	-	-	-	-	-	-
• 0208866C: *MD90: Aegis Hardware and Software Procurement*	124.150	104.241	81.791	-	81.791	-	-	-	-	-	-
• 0604878C: *Aegis BMD Test*	167.364	71.498	117.055	-	117.055	-	-	-	-	-	-
• 0604880C: *Land Based SM-3 (LBSM3)*	36.918	56.628	43.158	-	43.158	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

The Sea-Based Weapon Systems element acquisition approach supports evolutionary development, continuously building upon demonstrated capabilities to advance overall BMDS capability. After considering all the technical and management aspects of the program and to meet the requirements presented by an evolving ballistic missile threat, the Sea-Based Weapon Systems program awarded sole source contracts to Raytheon and Lockheed Martin to continue development of the SM-3 and the Aegis BMD Weapon System, respectively.

The M&S acquisition strategy utilizes full and open competition to develop, acquire and deliver the integrated architectures/frameworks, as well as develop and deliver models of Aegis systems. The Digital and HWIL product centers integrate the suite of M&S into a composite simulation capability, all based on an open architecture. M&S achieves this end-state via close collaboration between its integrating contractor teams (Digital and HWIL) and those of the Aegis BMD prime contractors, with additional technical standards and engineering oversight provided by Federally Funded Research and Development Centers (FFRDCs) and University Affiliated Research Centers (UARCs).

The Layered Homeland Defense acquisition strategy leverages existing Sea-Based Weapon System program awarded sole source contracts with Raytheon and Lockheed Martin to continue development of the SM-3 and the Aegis BMD Weapon Systems. Acquisition requirements for the transportable deployment option will also use existing contracts within Sea-Based Weapon Systems or within the partner element on the project. Additional information can be provided at the appropriate classification level.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering & Integration - Systems Engineering	Various	MDA Various : VA, AL	67.170	1.813	Nov 2019	1.330	Nov 2020	0.936	Nov 2021	-		0.936	Continuing	Continuing	Continuing
Systems Engineering & Integration - Systems Engineering - CSS	C/CPFF	TEAMS : VA	21.552	5.312	Nov 2019	4.262	Nov 2020	5.485	Nov 2021	-		5.485	Continuing	Continuing	Continuing
Systems Engineering & Integration - Systems Engineering - Industry	C/CPAF	Boeing : VA	75.585	13.292	Nov 2019	13.407	Nov 2020	13.300	Nov 2021	-		13.300	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - MD09 - TD APL	SS/CPAF	JHU/APL : Columbia, MD	37.849	9.261	Nov 2019	12.260	Nov 2020	6.660	Nov 2021	-		6.660	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - MD09 - TD LM	C/CPFF	Lockheed Martin : Moorestown, NJ	35.545	3.284	Nov 2019	5.030	Nov 2020	7.730	Nov 2021	-		7.730	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - MD09 - TD MIT	MIPR	Hanscom AFB - MIT/ LL : Lexington, MA	20.586	5.074	Nov 2019	5.677	Nov 2020	3.651	Nov 2021	-		3.651	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - MD09 - TD MITRE	MIPR	CECOM - MITRE : Dahlgren, VA	3.565	0.496	Nov 2019	1.966	Nov 2020	0.474	Nov 2021	-		0.474	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - MD09 - TD NSWCDD	MIPR	NSWC DD : Dahlgren, VA	35.536	8.644	Nov 2019	12.148	Nov 2020	8.354	Nov 2021	-		8.354	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - NIWC Pacific	MIPR	NIWC PAC : San Diego, CA	10.185	5.436	Nov 2019	7.059	Nov 2020	9.186	Nov 2021	-		9.186	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - Strategic Investment	MIPR	Various : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	0.000
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - Technology Design and Insertion - Discrimination	MIPR	Various - MDA : AL,VA	15.895	1.745	Nov 2019	2.193	Nov 2020	0.000		-		0.000	0.000	19.833	0.000
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - Technology Design and Insertion - M&S improvements	MIPR	Various - MDA : AL, VA	0.000	8.913	Nov 2019	9.928	Nov 2020	10.235	Nov 2021	-		10.235	Continuing	Continuing	Continuing
Aegis Ballistic Missile Defense (BMD) Technology Design and Insertion - Various - MDA	MIPR	Various - MDA : AL,VA,CA	28.511	4.066	Nov 2019	0.306	Nov 2020	0.000		-		0.000	0.000	32.883	0.000
Aegis BMD 4.x Development - BMD 4.0 Dev -MD09- Aegis Techrep	MIPR	AEGIS Techrep : Moorestown, NJ	3.582	0.865	Nov 2019	4.684	Nov 2020	2.947	Nov 2021	-		2.947	Continuing	Continuing	Continuing
Aegis BMD 4.x Development - BMD 4.0 Dev. - MD09 - Dahlgren	MIPR	NSWC/DD : DAHLGREN, VA	155.675	5.111	Nov 2019	6.443	Nov 2020	9.404	Nov 2021	-		9.404	Continuing	Continuing	Continuing
Aegis BMD 4.x Development - BMD 4.0 Dev. - MD09 - Lockheed Martin	SS/CPIF	LOCKHEED MARTIN : MOORESTOWN, NJ	835.052	55.261	Nov 2019	49.509	Nov 2020	41.856	Nov 2021	-		41.856	Continuing	Continuing	Continuing
Aegis BMD 4.x Development - BMD 4.0 Dev. -MD09- BMD 4.0 Dev-	Various	Various : Various	44.610	2.120	Nov 2019	4.968	Nov 2020	2.506	Nov 2021	-		2.506	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Aegis BMD 4.x Development - BMD 4.0 Dev.-MD09-D	MIPR	MDA : VA	31.834	0.000		8.591	Nov 2020	0.000		-		0.000	0.000	40.425	0.000
Aegis BMD 5.x Development - MD09 - 5.x	SS/CPAF	LOCKHEED MARTIN : MOORESTOWN, NJ	721.217	11.834	Nov 2019	35.117	Nov 2020	33.595	Nov 2021	-		33.595	Continuing	Continuing	Continuing
Aegis BMD 5.x Development - MD09 - 5.x APL	SS/CPFF	JHU/APL/MD : COLUMBIA, MD	54.663	0.000		2.828	Nov 2020	2.489	Nov 2021	-		2.489	Continuing	Continuing	Continuing
Aegis BMD 5.x Development - MD09 - 5.x DD	MIPR	NSWC/DD : DAHLGREN, VA	77.211	1.375	Nov 2019	9.331	Nov 2020	8.213	Nov 2021	-		8.213	Continuing	Continuing	Continuing
Aegis BMD 5.x Development - MD09 - 5.x PHD	MIPR	NSWC/PHD : PT HUENEME, CA	11.463	0.929	Nov 2019	0.935	Nov 2020	0.823	Nov 2021	-		0.823	Continuing	Continuing	Continuing
Aegis BMD 5.x Development - MD09 - AW	MIPR	Aegis Tech Rep : Moorestown, NJ	4.509	1.776	Nov 2019	1.187	Nov 2020	1.045	Nov 2021	-		1.045	Continuing	Continuing	Continuing
Aegis BMD 5.x Development - MD09 - Various	MIPR	Various : MA, MD, VA, NJ	209.059	0.000		2.284	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Aegis BMD 6.x Development - D - Strategic Investment	MIPR	Various : Various	0.000	0.000		0.000		4.786	Nov 2021	-		4.786	Continuing	Continuing	Continuing
Aegis BMD 6.x Development - JHU/APL	SS/CPFF	JHU/APL : MD	13.827	6.132	Nov 2019	5.978	Nov 2020	7.006	Nov 2021	-		7.006	Continuing	Continuing	Continuing
Aegis BMD 6.x Development - Lockheed Martin	C/CPFF	Lockheed Martin : NJ	76.378	47.263	Nov 2019	70.797	Nov 2020	53.270	Nov 2021	-		53.270	Continuing	Continuing	Continuing
Aegis BMD 6.x Development - MD09 - DD	MIPR	NSWC/DD : Dahlgren, VA	11.659	8.432	Nov 2019	5.932	Nov 2020	9.634	Nov 2021	-		9.634	Continuing	Continuing	Continuing
Aegis BMD 6.x Development - Raytheon Integrated Defense Systems	MIPR	Raytheon : Waltham, MA	0.000	0.000		0.000		4.579	Nov 2021	-		4.579	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Aegis BMD 6.x Development - Various	MIPR	Various : MA, MD, VA, NJ, CA	27.104	9.287	Nov 2019	5.931	Nov 2020	5.168	Nov 2021	-		5.168	Continuing	Continuing	Continuing
Aegis Layered Homeland Defense Development - Aegis Engineering - APL	SS/CPFF	JHU/APL : MD	0.000	1.369	Nov 2019	2.000	Nov 2020	7.553	Nov 2021	-		7.553	Continuing	Continuing	Continuing
Aegis Layered Homeland Defense Development - Aegis Engineering - DD	MIPR	NSWC DD : Dahlgren VA	0.000	1.712	Nov 2019	2.000	Nov 2020	9.163	Nov 2021	-		9.163	Continuing	Continuing	Continuing
Aegis Layered Homeland Defense Development - Aegis Engineering - LM	SS/CPFF	Lockheed Martin : Moorestown NJ	0.000	0.327	Nov 2019	6.969	Nov 2020	15.800	Nov 2021	-		15.800	Continuing	Continuing	Continuing
Aegis Layered Homeland Defense Development - Aegis Engineering - MIT/ LL	MIPR	MIT/LL : Lexington MA	0.000	1.183	Nov 2019	1.500	Nov 2020	8.050	Nov 2021	-		8.050	Continuing	Continuing	Continuing
Aegis Layered Homeland Defense Development - Aegis Engineering - RMS	SS/CPIF	Raytheon : AZ	0.000	0.000		0.000		8.960	Nov 2021	-		8.960	Continuing	Continuing	Continuing
Aegis Layered Homeland Defense Development - Aegis Weapon System - MD09 - Aegis Techrep	MIPR	Aegis Techrep : Moorestown NJ	0.000	0.000		0.000		0.499	Nov 2021	-		0.499	Continuing	Continuing	Continuing
Aegis Layered Homeland Defense Development - Aegis Weapon System - MD09 - DD	MIPR	NSWC DD : Dahlgren VA	0.000	0.000		0.000		0.832	Nov 2021	-		0.832	Continuing	Continuing	Continuing
Aegis Layered Homeland Defense Development - Aegis Weapon System - MD09 - LM	SS/CPFF	Lockheed Martin : Moorestown NJ	0.000	2.128	Nov 2019	0.000		37.861	Nov 2021	-		37.861	Continuing	Continuing	Continuing
Aegis Layered Homeland Defense Development - Standard Missile - 3 (SM-3) Block IIA Development - MD09 - Raytheon	SS/CPIF	Raytheon : AZ	0.000	2.770	Nov 2019	0.000		10.245	Nov 2021	-		10.245	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Aegis Layered Homeland Defense Development - Strategic Investment	MIPR	Various : Various	0.000	0.106	Nov 2019	0.000		0.000		-		0.000	0.000	0.106	0.000
Modeling & Simulation Objective Simulation Framework - M&S OSF Engineering	Various	MDA : AL, VA	16.927	1.807	Nov 2019	5.453	Nov 2020	4.224	Nov 2021	-		4.224	Continuing	Continuing	Continuing
Modeling & Simulation Objective Simulation Framework - M&S OSF Engineering - CSS Support	C/CPFF	TEAMS : AL, CO	24.540	7.344	Nov 2019	6.375	Nov 2020	5.547	Nov 2021	-		5.547	Continuing	Continuing	Continuing
Modeling & Simulation Objective Simulation Framework - M&S OSF Engineering - Engineering Support	C/CPAF	Northrop Grumman : CO	41.660	0.000		0.000		0.000		-		0.000	0.000	41.660	0.000
Modeling & Simulation Objective Simulation Framework - M&S OSF Engineering - Integration	MIPR	CCDC : AL	26.933	3.090	Nov 2019	4.067	Nov 2020	3.398	Nov 2021	-		3.398	Continuing	Continuing	Continuing
Modeling & Simulation Objective Simulation Framework - M&S OSF Engineering - Prime	C/CPFF	Teledyne Brown Engineering / TBD : AL, CO	151.236	22.647	Nov 2019	0.000		0.000		-		0.000	0.000	173.883	0.000
Modeling & Simulation Objective Simulation Framework - M&S OSF Engineering - Prime 2	C/CPFF	Lockheed Martin : AL	0.000	0.000		16.934	Nov 2020	20.197	Nov 2021	-		20.197	Continuing	Continuing	Continuing
M&S BMDS Simulations &Tools - Sims & Tools	C/CPFF	Teledyne Brown Engineering : AL, CO	3.558	0.000		0.000		0.000		-		0.000	0.000	3.558	0.000
M&S BMDS Simulations &Tools - Sims & Tools - Industry	C/CPAF	Northrop Grumman : CO	40.308	0.000		0.000		0.000		-		0.000	0.000	40.308	0.000
M&S BMDS Simulations &Tools - Sims & Tools - Industry (2)	C/CPAF	SWDC : CO	0.000	3.700	Nov 2019	4.069	Nov 2020	3.355	Nov 2021	-		3.355	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
M&S BMDS Simulations &Tools - Sims & Tools - Various	Various	Various : AL, CO	0.659	0.760	Nov 2019	0.474	Nov 2020	1.100	Nov 2021	-		1.100	Continuing	Continuing	Continuing
BMDS Verification, Validation & Assessment (VV&A) - Verification & Assessment	Various	MDA Various : AL, VA	7.395	0.000		0.000		0.000		-		0.000	0.000	7.395	0.000
BMDS Verification, Validation & Assessment (VV&A) - Verification & Assessment - CSS Support	C/CPFF	TEAMS : AL	16.058	0.806	Nov 2019	1.531	Nov 2020	2.462	Nov 2021	-		2.462	Continuing	Continuing	Continuing
BMDS Verification, Validation & Assessment (VV&A) - Verification & Assessment - Industry	C/CPAF	Boeing : AL	27.381	6.776	Nov 2019	9.365	Nov 2020	7.370	Nov 2021	-		7.370	Continuing	Continuing	Continuing
BMDS Verification, Validation & Assessment (VV&A) - Verification & Assessment - Labs	MIPR	MITRE : VA	9.617	2.236	Nov 2019	1.368	Nov 2020	0.847	Nov 2021	-		0.847	Continuing	Continuing	Continuing
BMDS Verification, Validation & Assessment (VV&A) - Verification & Assessment - OGA	MIPR	CCDC : AL	34.158	6.974	Nov 2019	7.038	Nov 2020	7.162	Nov 2021	-		7.162	Continuing	Continuing	Continuing
BMDS Verification, Validation & Assessment (VV&A) - Verification & Assessment - UARC2	MIPR	JHU/APL : AL, VA	4.121	1.857	Nov 2019	2.217	Nov 2020	2.071	Nov 2021	-		2.071	Continuing	Continuing	Continuing
RF Link Improvements - BL 9/ BL 10 Missile RF Link Improvements	MIPR	Various : TBD	0.000	0.000		0.000		1.357	Nov 2021	-		1.357	Continuing	Continuing	Continuing
RF Link Improvements - RF Link Improvements - Dahlgren	MIPR	NSWC - Dahlgren : Dahlgren, VA	0.000	0.000		0.000		2.009	Nov 2021	-		2.009	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
RF Link Improvements - RF Link Improvements - SM-3	SS/CPFF	Raytheon : Tucson, AZ	0.000	0.000		0.000		21.512	Dec 2021	-		21.512	Continuing	Continuing	Continuing
RF Link Improvements - RF Link Improvements - SM-3 APL	SS/CPFF	JHU/APL : Laurel, MD	0.000	0.000		0.000		1.511	Nov 2021	-		1.511	Continuing	Continuing	Continuing
RF Link Improvements - RF Link Improvements - WS	SS/CPIF	Lockheed Martin : Moorestown, NJ	0.000	0.000		0.000		1.036	Nov 2021	-		1.036	Continuing	Continuing	Continuing
		Subtotal	3,034.373	285.313		361.441		437.453		-		437.453	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	3,034.373	285.313		361.441		437.453		-		437.453	Continuing	Continuing	N/A

Remarks

Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, MIPRs, and civilian salaries on the R-3.
Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
BL 5.4.0 (BMD 4.1.2) EA	✦																											
BMD 6.0 IPR #4	✦																											
BL 5.4.1 (BMD 4.2) SRR		✦																										
BL 5.4.0 (BMD 4.1) Certification			★																									
BL 5.4.1 (BMD 4.2) IPR #1				▲																								
BMD 6.0 IPR #5				▲																								
BMD 5.1.2 Certification				★																								
BMD 5.1.3 BMDS OCB Testing				▲																								
BL 5.4.1 (BMD 4.2) IPR #2					▲																							
BMD 5.1.3 Certification					★																							
BMD 5.1.3 BMDS OCB Approval						▲																						
BL 5.4.1 (BMD 4.2) IPR #3							△																					
BMD 6.0 IPR #6							△																					
BMD 5.1.5 PSRR							△																					
BMD 5.1.4 CB 1.1 EA								◇																				
BMD 5.1.5 SRR								☆																				
BMD 5.1.6 PSRR								△																				
BMD 6.0 EA									△																			
BL 5.4.1 (BMD 4.2) IPR #4									△																			
BMD 5.1.5 IPR #1/PDR									☆																			
BMD 6.0 Capabilities EA									△																			
BMD 5.1.4 CB 1.1 SVR										△																		
BMD 5.1.4 CSCP #1										☆																		
BMD 5.1.6 SRR										☆																		

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

Significant Event Complete ▲ | Significant Event Planned △ | Milestone Decision Complete ★ | Milestone Decision Planned ☆ | Element Test Complete ◆ | Element Test Planned ◇ | System Level Test Complete ● | System Level Test Planned ○ | Complete Activity ✦ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
BMD 5.1.4 OCB #1											☆																	
BMD 5.1.5 CDR											☆																	
BMD 5.1.4 CB 2 EA											◇																	
BL 5.4.1 (BMD 4.2) EA												△																
BMD 5.1.4 CB 2 SVR												△																
BMD 5.1.5 IPR #2/CDR												☆																
BMD 5.1.4 CSCP #2												☆																
BMD 5.1.6 IPR #1/PDR												☆																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
BL 5.4.0 (BMD 4.1.2) EA	1	2020	1	2020
BMD 6.0 IPR #4	1	2020	1	2020
BL 5.4.1 (BMD 4.2) SRR	2	2020	2	2020
BL 5.4.0 (BMD 4.1) Certification	3	2020	3	2020
BL 5.4.1 (BMD 4.2) IPR #1	4	2020	4	2020
BMD 6.0 IPR #5	4	2020	4	2020
BMD 5.1.2 Certification	4	2020	4	2020
BMD 5.1.3 BMDS OCB Testing	4	2020	4	2020
BL 5.4.1 (BMD 4.2) IPR #2	1	2021	1	2021
BMD 5.1.3 Certification	1	2021	1	2021
BMD 5.1.3 BMDS OCB Approval	2	2021	2	2021
BL 5.4.1 (BMD 4.2) IPR #3	3	2021	3	2021
BMD 6.0 IPR #6	3	2021	3	2021
BMD 5.1.5 PSRR	3	2021	3	2021
BMD 5.1.4 CB 1.1 EA	4	2021	4	2021
BMD 5.1.5 SRR	4	2021	4	2021
BMD 5.1.6 PSRR	4	2021	4	2021
BMD 6.0 EA	1	2022	1	2022
BL 5.4.1 (BMD 4.2) IPR #4	1	2022	1	2022
BMD 5.1.5 IPR #1/PDR	1	2022	1	2022
BMD 6.0 Capabilities EA	1	2022	1	2022
BMD 5.1.4 CB 1.1 SVR	2	2022	2	2022
BMD 5.1.4 CSCP #1	2	2022	2	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD09 / *Aegis BMD*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
BMD 5.1.6 SRR	2	2022	2	2022
BMD 5.1.4 OCB #1	3	2022	3	2022
BMD 5.1.5 CDR	3	2022	3	2022
BMD 5.1.4 CB 2 EA	3	2022	3	2022
BL 5.4.1 (BMD 4.2) EA	4	2022	4	2022
BMD 5.1.4 CB 2 SVR	4	2022	4	2022
BMD 5.1.5 IPR #2/CDR	4	2022	4	2022
BMD 5.1.4 CSCP #2	4	2022	4	2022
BMD 5.1.6 IPR #1/PDR	4	2022	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / *AEGIS BMD*	Project (Number/Name) MM09 / *Aegis BMD SM-3 Development*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MM09: *Aegis BMD SM-3 Development*	302.386	243.194	307.970	124.708	-	124.708	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2021 to FY 2022 reflects the reduction of development activities including the GEU ECP, SWUP build 8, and incorporating SWUP build 8 into the production line. This decrease is offset by a minor increase due to transfer of Missile Cyber from Budget Project MC09 - Cyber Operations.

A. Mission Description and Budget Item Justification

Provides development of SM-3 Missiles, Upgrade Modifications, and Integration into the Aegis Weapon System.

The SM-3 Block IB improves Aegis BMD's ability to expand the BMD battlespace, engage longer range, more sophisticated ballistic missiles that may deploy countermeasures and launch in larger raid sizes. The SM-3 Block IB Kinetic Warhead's (KW) two color infra-red (IR) seeker and advanced signal processor provides a real-time discrimination and characterization capability while improving sensitivity for longer range targets and performance against more sophisticated threats. Additionally, the new Throttleable Divert and Attitude Control System (TDACS) KW divert engine has been upgraded over the SM-3 Block IA to provide a more flexible divert in order to maneuver the KW to intercept.

The SM-3 Block IIA consists of an upgrade to a 21-inch diameter SM-3 missile and expands beyond the SM-3 Block IB battlespace to counter Intermediate Range Ballistic Missile (IRBM). SM-3 Block IIA provides an increased kinematic envelope through improved IR discrimination and divert capability that provide performance against the EPAA phase III expanded threat set. When combined with Aegis BMD 5.1 weapon system modifications, the SM-3 Block IIA will provide Engage on Remote (EoR) capability, which allows the use of remote off board sensor information to launch and guide the SM-3 Block IIA to final intercept. Aegis BMD 5.1 EoR capability with SM-3 Block IIA also frees up radar resources and increases the number and type of threats to be engaged simultaneously over previous baselines.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Standard Missile-3 (SM-3) Block IB Development	35.652	47.133	51.298
Articles:	-	-	-
Description: This effort modernizes the SM-3 Block IB missile, which improves on the SM-3 Block IA performance and enables engagement of more sophisticated ballistic missiles and larger raid sizes SM-3 Block IB Threat Upgrade (TU)/Technology Refresh (TR) (previously IB Modernization) will provide the following: - Refreshed SM-3 KW Common Avionics Package will provide improved producibility and utilization of common components between the SM-3 Block IIA. SM-3 Block IB common components will be extendable to support different form/fit in circuit card assemblies across SM-3 Block IB and SM-3 Block IIA and will mitigate SM-3 Block IB hardware availability issues. Includes Back-fit of IIA GEU ECP into IB			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MM09 / *Aegis BMD SM-3 Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Refreshed SM-3 Block IB Guidance Section (GS) with the integration of Digital Data Link (DDL) replacement of Plate 3A will resolve Plate 3A hardware availability issues Recurring Accomplishments: - Assess performance with weapons systems upgrades/modifications and against emerging threats Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SM-3 KW Common Avionics - Development of SM-3 Block IB Circuit Card Assemblies (CCAs) to be common with SM-3 Block IIA(IB Common Components will be extendable to support different form/fit in CCAs across SM-3 Block IB, and SM-3 Block IIA) - Back-fit of SM-3 Block IIA GEU ECP into SM-3 Block IB; integration and test to ensure Legacy SM-3 Block IB performance is met; and Digital Integrated Circuit technology - Continue integration of DDL replacement of Plate 3A ***FY 2022 Plans:*** - SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides for SM-3 Block IB TU/TR to modernize the Advance Signal Processor (ASP) and mitigate obsolescence issues in the ASP.			
Title: Standard Missile-3 (SM-3) Block IIA Development	207.542	260.837	73.410
Articles:	-	-	-
Description: The SM-3 Block IIA is required to meet EPAA Phase III. It will increase the area that can be defended by Aegis BMD, increase the probability of kill against a larger threat set, and leverage enhanced capability provided by BMDS sensor upgrades Recurring Accomplishments: - Conduct SM-3 Block IIA software update to support engagements against additional complex threats identified during Aegis BMD 5.1 design process conducted after missile CDR - Conduct End to End Distributed Development System (ETEDDS) integration testing; and flight test support - Continue implementation of SM-3 Block IIA cost reduction initiatives to support meeting cost goals to reduce the current estimated Average Unit Production Price (AUPP) - Continue transition of KW hardware commonality effort (from design to material purchases) to system integration testing in order to demonstrate Technology Readiness Level (TRL) 7 - Continue Engineering Manufacture Readiness Level (EMRL) 3 compliance to support life cycle progression Specific and unique accomplishments to each FY are as follows:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MM09 / *Aegis BMD SM-3 Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
FY 2021 Plans: - Complete Software Update builds 8.1 - adds enhanced performance requirements for 6 new threats; and 8.2 - adds Missile Power Application Non-Launch (MPAN) capability, bringing Missile Reprogramming (MRP) to the missile and fleet allowing the Vertical Launch System to conduct Missile Built in Tests (MBIT) onboard the ship while underway and incorporates 3 additional threats. Additionally, allows the capability to update software of the SM-3 IIA Round while aboard the ship, thereby enhancing the ability to conduct updates, which historically only occurred during Recertification. - Complete MPAN Safety approval via Weapons Systems Explosive Safety Review Board (WSESRB) process and fleet introduction - GEU ECP planned activities: - Complete manufacturing readiness review at GEU ECP supplier and manufacturer to verify maturity and production readiness - Complete transition to production of GEU ECP into AURs - Continue Test planning and acquisition of test articles for environmental testing - Continue evaluation of the effects of space environments on the SM-3 Block IIA missile during flight ***FY 2022 Plans:*** - Conduct improved BMD 5.1 Raid to meet BMD 5.1 requirements, discrimination improvements to support future threats, and other BMD System Capability improvements aligned with AWS Baseline Improvements. - Integration and engineering of the SM-3 BLK IIA Build 8 missile with BMD AWS Baselines 5.x. - Completion of program Transition to Production (EMRL 4 maturity). - Complete GEU ECP qualification, integration and Transition to Production development. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the reduction of development activities including the GEU ECP, SWUP build 8, and incorporating SWUP build 8 into the production line. This decrease is offset by a minor increase due to transfer of Missile Cyber from Budget Project MC09 - Cyber Operations to MD09 to align with the FMR definition of weapons system cyber activities.			
Accomplishments/Planned Programs Subtotals	243.194	307.970	124.708

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208866C MD09: *SM-3 Block IB Procurement*	336.374	353.896	334.621	-	334.621	-	-	-	-	-	-
• 0208866C MD09: *Aegis BMD O&M*	74.642	79.913	68.293	-	68.293	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MM09 / *Aegis BMD SM-3 Development*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208866C MD14: *SM-3 Block IIA Procurement*	238.000	318.322	295.322	-	295.322	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The Sea-Based Weapon Systems element acquisition approach supports evolutionary development, continuously building upon demonstrated capabilities to advance overall BMDS capability. After considering all the technical and management aspects of the program and to meet the requirements presented by an evolving ballistic missile threat, the Sea-Based Weapon Systems program awarded sole source contracts to Raytheon and Lockheed Martin to continue development of the SM-3 and the Aegis BMD Weapon System, respectively.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MM09 / *Aegis BMD SM-3 Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development - MM09 Carderock	MIPR	NSWC Carderock : Bethesda, MD	0.436	0.446	Nov 2019	0.500	Nov 2020	0.000		-		0.000	0.000	1.382	0.000
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development - MM09	SS/CPIF	Raytheon : Tuscon, AZ	55.431	33.467	Dec 2019	43.662	Dec 2020	49.606	Dec 2021	-		49.606	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development - MM09 - 20117142332259	MIPR	NSWC/PHD : Port Hueneme, CA	0.145	0.054	Nov 2019	0.000		0.000		-		0.000	0.000	0.199	0.000
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development - MM09 - Various	MIPR	NSWC Corona : Corona, CA	0.424	0.296	Nov 2019	0.333	Nov 2020	0.260	Nov 2021	-		0.260	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development - MM09 MIT	MIPR	Hanscom AFB - MIT/ LL : Lexington, MA	1.105	0.000		0.000		0.000		-		0.000	0.000	1.105	0.000
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development- MM09 DD	MIPR	NSWC Dahlgren : Dahlgren, VA	1.201	0.407	Nov 2019	0.316	Nov 2020	0.420	Nov 2021	-		0.420	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IB Development - Standard Missile-3 (SM-3) Block IB Development- MM09 JHU/APL	SS/CPFF	JHUAPL : Laurel, MD	1.190	0.982	Nov 2019	2.322	Nov 2020	1.012	Nov 2021	-		1.012	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IIA Development -	MIPR	Various : CA, VA, MD	12.906	10.622	Nov 2019	3.742	Nov 2020	1.588	Nov 2021	-		1.588	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / *AEGIS BMD*	Project (Number/Name) MM09 / *Aegis BMD SM-3 Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Standard Missile-3 (SM-3) Block IIA Development - CA,VA, MD															
Standard Missile-3 (SM-3) Block IIA Development - Standard Missile-3 (SM-3) Block IIA Development - MM09 - SM-3 BLK IIA INTEGRATION	SS/CPIF	Raytheon : Tucson, AZ	186.601	164.987	Nov 2019	238.033	Mar 2021	63.733	Oct 2021	-		63.733	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IIA Development - Standard Missile-3 (SM-3) Block IIA Development - MM09 - SM-3 BLK IIA INTEGRATION - APL	MIPR	JHU/APL : Laurel, MD	20.535	10.364	Dec 2019	9.467	Dec 2020	4.017	Nov 2021	-		4.017	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IIA Development - Standard Missile-3 (SM-3) Block IIA Development - MM09 - SM-3 BLK IIA INTEGRATION - DD	MIPR	NSWC DD : Dahlgren, VA	10.183	5.882	Nov 2019	5.651	Nov 2020	2.398	Nov 2021	-		2.398	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IIA Development - Standard Missile-3 (SM-3) Block IIA Development - NSWC Corona	MIPR	NSWC Corona : Corona, CA	4.610	1.953	Nov 2019	2.799	Nov 2020	1.188	Nov 2021	-		1.188	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IIA Development - Standard Missile-3 (SM-3) Block IIA Development - NSWC/Crane	MIPR	NWSC/Crane : IN	1.496	0.970	Nov 2019	1.145	Nov 2020	0.486	Nov 2021	-		0.486	Continuing	Continuing	Continuing
Standard Missile-3 (SM-3) Block IIA Development - Standard Missile-3 (SM-3) Block IIA Development - MM09 - SM-3 BLK IIA	MIPR	Brookhaven Lab - DOE : Uptown NY	0.000	3.830	Oct 2019	0.000		0.000		-		0.000	0.000	3.830	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MM09 / *Aegis BMD SM-3 Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Standard Missile-3 (SM-3) Block IIA Development - Standard Missile-3 (SM-3) Block IIA Development - MM09 - SM-3 BLK IIA Draper	SS/CPIF	Draper Labatory : Cambridge MA	0.000	4.133	Oct 2019	0.000		0.000		-		0.000	0.000	4.133	0.000
Standard Missile-3 (SM-3) Block IIA Development - Standard Missile-3 (SM-3) Block IIA Development - NJ	C/CPFF	Lockheed Martin : Moorestown NJ	6.123	4.801	Dec 2019	0.000		0.000		-		0.000	0.000	10.924	0.000
		Subtotal	302.386	243.194		307.970		124.708		-		124.708	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	302.386	243.194		307.970		124.708		-		124.708	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MM09 / *Aegis BMD SM-3 Development*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
GEU ECP Qualification				✦																								
Build 8.1 Operational Capacity Baseline (OCB)					▲																							
Build 8.1 MPAN WSERB					▲																							
IBTU Tech Refresh PDR						▲																						
Build 8.3 with BMD 5.1.5 SRR								△																				
Build 8.2 Formal Qualification Testing (FQT)									△																			
IBTU Tech Refresh Qualification												△																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MM09 / *Aegis BMD SM-3 Development*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
GEU ECP Qualification	4	2020	4	2020
Build 8.1 Operational Capacity Baseline (OCB)	1	2021	1	2021
Build 8.1 MPAN WSERB	1	2021	1	2021
IBTU Tech Refresh PDR	2	2021	2	2021
Build 8.3 with BMD 5.1.5 SRR	4	2021	4	2021
Build 8.2 Formal Qualification Testing (FQT)	1	2022	1	2022
IBTU Tech Refresh Qualification	4	2022	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / *AEGIS BMD*	Project (Number/Name) MC09 / *Cyber Operations*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MC09: *Cyber Operations*	20.949	16.455	29.392	3.750	-	3.750	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2021 to FY 2022 reflects the transition of the following funds from the Cyber Operations Budget Project to MD09 Aegis BMD and MM09 Aegis BMD SM-3 Development to align with the FMR definition of weapons system cyber activities:
- RF Link Improvements Accomplishment from Budget Project MC09 Cyber Operations to Budget Project MD09 - Aegis BMD;
- Missile Cyber activities from the Network/System Certification and Accreditation (C&A) to Budget Project MM09; and
- Weapon Systems Cyber activities from the Network/System C&A Accomplishment to Budget Project MD09, Aegis BMD 6.X Accomplishment.

A. Mission Description and Budget Item Justification

Sustain the DoD Risk Management Framework (RMF) Certification and Accreditation process and Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments and reviews of proposed Program Manager/Information Systems Security Manager (PM/ISSM).

This project supports the monitoring and tracking of Cybersecurity mitigation detailed in Information Technology Security Plan of Action and Milestones (POA&Ms). Activities include preparation of C&A documentation and accreditation recommendations to the MDA Authorizing Official (AO). Independent Verification and Validation (IV&V) team actions ensure the availability, integrity, authentication, confidentiality and non-repudiation of the AB mission and non-mission systems, which includes test and remote site administrative systems. Activities in the Project are necessary to comply with the Federal Information Security Management Act (FISMA).

The SM-3 Block IB and IIA missiles and corresponding Aegis BMD weapon systems communication requires hardware and software development and integration testing to enable new cyber security capabilities. Activities include Encoder/Decoder, Plate 3 CCAs and Mission Computer CCA updates. After missile and baseline specific efforts are complete, significant integration testing is required.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Network / System Certification and Accreditation (C&A)	7.665	11.337	3.750
Articles:	-	-	-
Description: Network/System Certification and Accreditation (C&A) includes recurring efforts such as cybersecurity engineering and architecture requirements planning for Aegis BMD systems, plan and test the Risk Management Framework (RMF) controls for the BMDS in regards to Aegis BMD systems to comply with the new directive, RMF for DoD Information Technology (DoDi 8510.01) to replace the DoD Information Assurance Certification and Accreditation process (DIACAP) and conduct Controls Validation Testing (CVT.			
Recurring Accomplishments:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MC09 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Continue coordination and development of new and existing accreditation packages that comply with new directive, RMF for DoD Information Technology (DoDi 8510.01) process - Conduct regular Controls Validation Testing (CVT) and cooperative risk assessments to mitigate cybersecurity deficiencies - Develop and deploy Hardware and Software HW/SW implementation strategies for Continuous Monitoring activities at remote sites and Aegis BMD assets - Monthly reviews of systems through the eMass System - Daily management of eMass System Plan of Action and Milestones (POAMs) ***FY 2021 Plans:*** -SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the realignment of requirement to SM-3 Blk IIA Development (MM09) for system specific cyber development or component modification efforts and Weapon Systems Cyber activities to MD09.			
Title: RF Link Improvements	8.790	18.055	0.000
Articles:	-	-	-
Description: The U.S. Navy is pursuing improvements identified by Engineering Topic 17 (ET-17) within Aegis Baseline 10 development and specific missile type. Radio Frequency (RF) Link Security Improvements will advance communications between Aegis BMD Weapon System and SM-3 Block IB and IIA missile variants. Product development and implementation will enable missile hardware enhancements in order to achieve the full requisite Missile RF Link Security Improvements. ***FY 2021 Plans:*** - Begin software development and hardware prototype efforts to include initial integration testing - Conduct analysis and design trades to define encryption scheme for the weapon system, including backwards compatibility with missiles without RF Link Security upgrades - Update Aegis BMD Weapon System requirements and interface specifications to incorporate changes between the weapon system and missile message link ***FY 2022 Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MC09 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
All efforts for this Accomplishment transitioned from Budget Project, MC09 Cyber Operations to Budget Project MD09 beginning in FY 2022 to align with the FMR definition of weapons system cyber activities.			
Accomplishments/Planned Programs Subtotals	16.455	29.392	3.750

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603882C: *Ballistic Missile Defense Midcourse Defense Segment*	1,275.414	1,219.261	745.144	-	745.144	-	-	-	-	-	-
• 0603884C: *Ballistic Missile Defense Sensors*	348.356	265.803	224.750	-	224.750	-	-	-	-	-	-
• 0603896C: *Ballistic Missile Defense Command and Control, Battle Management & Communication*	550.513	645.741	603.448	-	603.448	-	-	-	-	-	-
• 0603898C: *Ballistic Missile Defense Joint Warfighter Support*	51.095	49.560	50.594	-	50.594	-	-	-	-	-	-
• 0603904C: *Missile Defense Integration and Operations Center (MDIOC)*	54.783	55.356	52.403	-	52.403	-	-	-	-	-	-
• 0604878C: *Aegis BMD Test*	167.364	71.498	117.055	-	117.055	-	-	-	-	-	-
• 0604880C: *Land Based SM-3 (LBSM3)*	36.918	56.628	43.158	-	43.158	-	-	-	-	-	-
• 0901598C: *Management HQ - MDA*	27.065	26.902	24.102	-	24.102	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The Sea-Based Weapon Systems element acquisition approach supports evolutionary development, continuously building upon demonstrated capabilities to advance overall BMDS capability. After considering all the technical and management aspects of the program and to meet the requirements presented by an evolving ballistic missile threat, the Sea-Based Weapon Systems program awarded sole source contracts to Raytheon and Lockheed Martin to continue development of the SM-3 and the Aegis BMD Weapon System, respectively.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / *AEGIS BMD*	Project (Number/Name) MC09 / *Cyber Operations*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Network / System Certification and Accreditation (C&A) - CND/IA Advisory and Assistance Services	C/CPIF	Torch Technologies : Huntsville, AL	2.747	0.000		0.000		0.000		-		0.000	0.000	2.747	0.000
Network / System Certification and Accreditation (C&A) - Cyber TEAMs - MC09	C/CPFF	Booz Allen and Hamilton : McLean, VA	7.128	4.000	Nov 2019	2.815	Nov 2020	2.757	Nov 2021	-		2.757	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Network / System Certification and Accreditation (C&A) - Network System Certification and Accreditation - RMS	SS/CPAF	Raytheon : Tucson, AZ	0.000	0.000		1.486	Nov 2020	0.000		-		0.000	0.000	1.486	0.000
Network / System Certification and Accreditation (C&A) - Network System Certification and Accreditation	SS/CPAF	Lockheed Martin : Moorestown NJ	8.148	3.665	Nov 2019	5.672	Nov 2020	0.000		-		0.000	0.000	17.485	0.000
Network / System Certification and Accreditation (C&A) - Network System Certification and Accreditation - DISA	TBD	DISA : Falls Church, VA	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	0.000
Network / System Certification and Accreditation (C&A) - Network System Certification and Accreditation - PHD	MIPR	NSWC/PHD : Port Hueneme CA	0.501	0.000		0.000		0.000		-		0.000	0.000	0.501	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / *AEGIS BMD*	Project (Number/Name) MC09 / *Cyber Operations*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Network / System Certification and Accreditation (C&A) - Network/System Certification and Accreditation - DD	MIPR	NSWC - DD : Dahlgren VA	1.300	0.000		0.000		0.000		-		0.000	0.000	1.300	0.000
Network / System Certification and Accreditation (C&A) - Program Operations - MC09 - CivSal	Allot	MDA : VA	0.343	0.000		0.707	Nov 2020	0.156	Nov 2021	-		0.156	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Security Operations - Secure Communications/ Equipment	C/CPFF	Jacobs Technology : TN	0.682	0.000		0.657	Nov 2020	0.837	Nov 2021	-		0.837	Continuing	Continuing	Continuing
RF Link Improvements - RF Link Improvements - Dahlgren	MIPR	NSWC-Dahlgren : Dahlgren, VA	0.000	0.000		1.453	Nov 2020	0.000		-		0.000	0.000	1.453	0.000
RF Link Improvements - RF Link Improvements - SM-3	SS/CPFF	Raytheon : Tucson, AZ	0.000	8.390	Mar 2020	15.567	Nov 2020	0.000		-		0.000	0.000	23.957	0.000
RF Link Improvements - RF Link Improvements - SM-3 APL	SS/CPFF	JHU/APL : Laurel, MD	0.000	0.000		0.293	Apr 2021	0.000		-		0.000	0.000	0.293	0.000
RF Link Improvements - RF Link Improvements - WS	SS/CPIF	Lockheed Martin : Moorestown, NJ	0.000	0.400	Mar 2020	0.742	Nov 2020	0.000		-		0.000	0.000	1.142	0.000
		Subtotal	20.949	16.455		29.392		3.750		-		3.750	Continuing	Continuing	N/A

Remarks

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / *AEGIS BMD*	Project (Number/Name) MC09 / *Cyber Operations*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	20.949	16.455		29.392		3.750		-		3.750	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MC09 / *Cyber Operations*

Significant Event Complete ▲ | Significant Event Planned △ | Milestone Decision Complete ★ | Milestone Decision Planned ☆ | Element Test Complete ◆ | Element Test Planned ◇ | System Level Test Complete ● | System Level Test Planned ○ | Complete Activity ✦ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MC09 Cyber Operations	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MC09 / *Cyber Operations*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MC09 Cyber Operations	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / *AEGIS BMD*	Project (Number/Name) MX09 / *Aegis BMD Development Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MX09: *Aegis BMD Development Support*	527.151	151.772	148.030	136.506	-	136.506	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2021 to FY 2022 reflects the completion of the Integrated Air and Missile Defense (IAMD) Cerebus Mission Planner upgrades.

A. Mission Description and Budget Item Justification

This includes the Government, contractor, and Federally Funded Research and Development Center (FFRDC) workforce that manage the overall Sea-Based Weapon Systems program and enables the program to develop, build, and test standard missiles and associated Aegis Weapons Systems. Sea-Based Weapon Systems, in accordance with negotiated agreements between the U.S. Navy and the Missile Defense Agency (MDA) has identified and segregated funding for Developmental Support of Sea-Based Weapon Systems specific elements resident aboard Aegis capable U.S. Navy ships. Computer Program Support consists of, but is not limited to, reviews of Technical Observation Reports (TORs) that are generated by ship crews during exercises or deployments, determination of root causes and preparation of Computer Program Change Request (CPCR) to correct TORs, updates to the in-service computer program to apply, test and certify multiple CPCRs, and tests installation of Aegis Weapon System (AN/SPY-radar/Fire Control System (FCS)) alignment updates as required. Sea-Based Weapon Systems provides support to Annual Integration Events (AIEs) to ensure any updated Aegis Combat System (ACS) computer programs do not degrade BMD equipped ships and provides distance and technical support for BMD equipped ships. Provides Fleet operations and mission support to enable the conduct of sustained BMD operation.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Operations	86.636	82.685	85.575
Articles:	-	-	-
Description: This activity includes the Government, contractor, and FFRDC workforce that manage the overall Sea-Based Weapon Systems program and enables the program to develop, build, and test standard missiles and the associated Aegis Weapon Systems. This project includes all operations support for the Aegis program office in Engineering, Testing, Logistics, Acquisition, Safety, Quality Assurance, Finance, Budget Formulation and Execution, Cost Estimation, and Earned Value Management in support of development activities. Specific and/or unique accomplishments to each FY are as follows:			
FY 2021 Plans: - SEE ABOVE.			
FY 2022 Plans: - SEE ABOVE			
FY 2021 to FY 2022 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MX09 / *Aegis BMD Development Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
N/A			
Title: Aegis Ballistic Weapon System Support	18.891	24.594	22.123
Articles:	-	-	-
Description: Provides system engineering for fielded Sea-Based Weapon Systems from warfighter feedback, investigation of BMDS Discrepancy Reports, and BMDS ground test observation analysis. It includes computer program defect corrections and supports assessment of flight test readiness. Recurring Accomplishments: - Update threat adaptation data to keep pace with emergent threats - Provide operation and sustainment of land based test sites used for the development of Aegis BMD baselines. Operation and sustainment includes Engineering, Logistics, Quality Assurance, Configuration Management and other support activities to both baseline development and the sites. - Provide support for contingency operations of national interest - Support upgrades to fielded Aegis BMD computer programs baselines approved as an Operational Capacity Baseline - Provide engineering support to Operationally Capable Baseline ships that participate in BMD test events - Provide test site usage for maintenance and support of baselines under development - Sustain the classified computing infrastructure needed for development efforts Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Fleet Integration	21.468	24.702	17.444
Articles:	-	-	-
Description: Provide Fleet operations and mission support to enable the conduct of sustained BMD operations; advocate war fighter requirements and fleet feedback in baseline development and capability upgrades to Aegis BMD weapon system; provide analysis and Mission Planning support for Geographic Combatant Commanders for operational application of Maritime BMD capabilities; and provide BMD Capabilities Analysis and Exercise Support for Aegis BMD baselines under development or currently deployed in the Operational Fleet. Recurring Accomplishments:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MX09 / *Aegis BMD Development Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Define, develop and review Joint and Fleet Doctrine for incorporation of Aegis BMD capability transition to warfighter and baseline acceptance into MDA OCB - Research and define certification and warfighter acceptance requirements for Aegis BMD baselines to ensure successful capability delivery - Develop Aegis BMD training simulations and scenarios to support shipboard training including BMD Qualification (BMDQ) and higher level exercises - Execute warfighter feedback process to enhance Aegis BMD functional capability development and influence future Aegis BMD requirements and support MDA Test Community and Combatant Commanders in BMD Exercises and Wargames - Provide analysis for Anti-Ship Ballistic Missile Defense - Provide analysis on parametric organic sensor sensitivity - Provide analysis on up-range ship/sensor support for Launch on Remote (LoR), Engage on Remote (EoR), and Cued engagements - Provide analysis on impacts of countermeasures - Provide analysis on developing threats Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - Provide optimization of multi-baseline/ship defense designs in order to accomplish force defense design planning. - Provide limited Anti-Air Warfare (AAW) depth of fire calculations. Navy BMD assets need to account for air threats that impact their ship operating area integrated BMD/AAW mission. - Deploy Maritime Tactical Command and Control (MTC2) cloud device for local storage and mission planning computing in order to support collaboration across ship networks (afloat-to-ashore) and future mission planning software and data library updates - Incorporate MTC2 into Aegis BMD Mission Planner Prototype (Cerberus) to provide multi-mission planning and de-confliction (BMD, air, surface, etc.) - Develop Capability Insertion and Requirements to resolve warfighter feedback design issues. Build warfighter requirement into current baseline on a more frequent schedule. - Mission Planner Integrated Product Team (IPT) Lead. Synchronizes mission planning efforts across the program. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the completion of the IAMD Cerebus Mission Planner upgrades.			
Title: Infrastructure Upgrades	24.777	16.049	11.364
Articles:	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MX09 / *Aegis BMD Development Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Description: Provides management of C4I aspects of the BMDS Test Site (BTS) San Diego upgrade plan to maintain Fleet representative C4I configurations to support testing, troubleshooting, and Fleet operations. Includes IT services in support of the Aegis RDT&E mission to include: IT help-desk services; portal and data services; records management; business automation services; and desktop and Special Purpose Processing Nodes (SPPNs) maintenance and licenses. In addition, replaces critical IT infrastructure at end-of-life and to implement DoD mandated projects in support of the Joint Information environment (JIE) initiative. Recurring accomplishments: - Procure and installation of two TI-16 Mod 1 Baseline 10 labs to support MDA Ground Testing commencing in FY22 - Procure and installation of two Detection Simulation (DETSIM) Emulators to support AN/APY-6 testing commencing in FY22 - Procure and installation of three Virtual Twin/VTE - IDIQ Contract # N002418F8622 / PR# 1300855404 commencing in FY22 - Establishment of Cooperative Engagement Capability (CEC) lab and interaction to Aegis BMD labs - Conduct Aegis IT services such as IT help-desk; portal and data services; records management; business automation services; and desktop and SPPN maintenance and licenses - Replacement of critical end-of-life equipment - Upgrades to IT infrastructure planning and implementation efforts to accomplish DoD mandated IT Projects (JIE and DoD Chief Information Officer (CIO) Information Resources Management (IRM) initiatives. ***FY 2021 Plans:*** - SEE ABOVE ***FY 2022 Plans:*** - Develop, procure and install Combined Federated Battle Laboratories Network (CFBLNet) allowing MDACNET chat and voice capability - Develop, procure and install Program Executive Office Integrated Warfare Systems-Cyber (PEO IWS-C) Integrated Air and Missile Defense (IAMD) Risk Reduction Testing with IFF Senor and Tactical Air (TACAIR) capabilities ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects transition of BTS Hardware.			
Title: Joint Emerging Operational Need (JEON)	0.000	0.000	0.000
Articles:	-	-	-
Description: N/A			
FY 2021 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MX09 / *Aegis BMD Development Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
N/A ***FY 2022 Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	151.772	148.030	136.506

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208866C MD09: *MD09 Aegis BMD O&M*	74.642	79.913	68.293	-	68.293	-	-	-	-	-	-
• 0604878C: *Aegis BMD Test*	167.364	71.498	117.055	-	117.055	-	-	-	-	-	-
• 0604880C: *Land Based SM-3 (LBSM3)*	36.918	56.628	43.158	-	43.158	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The Sea-Based Weapon Systems element acquisition approach supports evolutionary development, continuously building upon demonstrated capabilities to advance overall BMDS capability. After considering all the technical and management aspects of the program and to meet the requirements presented by an evolving ballistic missile threat, the Sea-Based Weapon Systems program awarded sole source contracts to Raytheon and Lockheed Martin to continue development of the Standard Missile-3 (SM-3) and the Aegis BMD Weapon System, respectively.

Competition will be maximized for purchase of any products or services as appropriate.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / *AEGIS BMD*	Project (Number/Name) MX09 / *Aegis BMD Development Support*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Operations - Program Operations - MX09 - GSA Procurement for MDA Historical Project	C/CPFF	Gryphon Technologies : VA	0.000	0.316	May 2020	0.000		0.000		-		0.000	0.000	0.316	0.000
Program Operations - Program Operations - MX09 - Civ Sal	Allot	MDA : VA	62.087	29.613	Nov 2019	34.933	Nov 2020	32.567	Nov 2021	-		32.567	Continuing	Continuing	Continuing
Program Operations - Program Operations - MX09 - DD PM	MIPR	NSWC/DD : Dahlgren, VA	6.873	2.038	Nov 2019	1.696	Nov 2020	0.000		-		0.000	0.000	10.607	0.000
Program Operations - Program Operations - MX09 - IT	Various	MDA : VA, AL	3.189	1.249	Nov 2019	1.517	Nov 2020	1.255	Dec 2021	-		1.255	Continuing	Continuing	Continuing
Program Operations - Program Operations - MX09 - MDA Travel	Allot	MDA : VA	4.517	0.586	Nov 2019	1.737	Nov 2020	0.785	Oct 2021	-		0.785	Continuing	Continuing	Continuing
Program Operations - Program Operations - MX09 - NAVSEA Civ Sal	MIPR	NAVSEA : Washington, DC	27.294	11.309	Nov 2019	14.156	Nov 2020	14.688	Nov 2021	-		14.688	Continuing	Continuing	Continuing
Program Operations - Program Operations - MX09 - NAVSEA RB Sal	MIPR	NAVSEA : Washington, DC	4.858	2.352	Nov 2019	1.745	Nov 2020	1.797	Nov 2021	-		1.797	Continuing	Continuing	Continuing
Program Operations - Program Operations - MX09 - NAVSEA Training, Various	MIPR	NAVSEA : Washington, DC	1.586	0.016	Nov 2019	0.030	Nov 2020	0.030	Nov 2021	-		0.030	Continuing	Continuing	Continuing
Program Operations - Program Operations - MX09 - NAVSEA Travel	MIPR	NAVSEA : Washington, DC	2.186	0.310	Nov 2019	0.000		0.000		-		0.000	0.000	2.496	0.000
Program Operations - Program Operations - MX09 - Security	MIPR	Various : VA	1.778	0.055	Nov 2019	0.285	Nov 2020	0.300	Nov 2021	-		0.300	Continuing	Continuing	Continuing
Program Operations - Program Operations - MX09 - TEAMS	C/CPFF	Various : VA, AL	92.842	38.792	Nov 2019	26.586	Nov 2020	34.153	Nov 2021	-		34.153	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MX09 / *Aegis BMD Development Support*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Aegis Ballistic Weapon System Support - MX09 - AW APL	SS/CPFF	JHU/APL : Columbia, MD	6.309	0.779	Nov 2019	0.929	Nov 2020	0.853	Nov 2021	-		0.853	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW DD	MIPR	NSWC DD : Dahlgren, VA	22.074	2.036	Nov 2019	3.768	Nov 2020	3.505	Nov 2021	-		3.505	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW LM	C/CPFF	Lockheed Martin : Moorestown, NJ	47.778	9.914	Nov 2019	2.284	Nov 2020	2.098	Nov 2021	-		2.098	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW NAVSEA	MIPR	NAVSEA : Washington, DC	56.793	4.763	Nov 2019	16.736	Nov 2020	14.861	Nov 2021	-		14.861	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW TECH REP	MIPR	Aegis Tech Rep : Moorestown, NJ	1.372	0.166	Nov 2019	0.470	Nov 2020	0.432	Nov 2021	-		0.432	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - AW Wallops	MIPR	SCSC : Wallops Island, VA	3.547	1.233	Nov 2019	0.407	Nov 2020	0.374	Nov 2021	-		0.374	Continuing	Continuing	Continuing
Aegis Ballistic Weapon System Support - MX09 - TD Various	MIPR	Various : San Diego, CA	32.663	0.000		0.000		0.000		-		0.000	0.000	32.663	0.000
Aegis Ballistic Weapon System Support - MX09 - AW PHD	MIPR	NSWC PHD : Port Hueneme, CA	0.956	0.000		0.000		0.000		-		0.000	0.000	0.956	0.000
Fleet Integration - MX09 - ABS	MIPR	NIWC : San Diego, CA	0.000	2.000	Nov 2019	0.000		1.000	Nov 2021	-		1.000	Continuing	Continuing	Continuing
Fleet Integration - MX09 - ABS APL	SS/CPFF	JHU/APL : Columbia, MD	0.000	0.000		0.000		5.939	Nov 2021	-		5.939	Continuing	Continuing	Continuing
Fleet Integration - MX09 - Fleet APL	SS/CPFF	JHU/APL/MD : Columbia, MD	28.451	12.927	Nov 2019	13.074	Nov 2020	5.773	Nov 2021	-		5.773	Continuing	Continuing	Continuing
Fleet Integration - MX09 - Fleet DD	MIPR	NSWC DD : Dahlgren, VA	10.490	2.062	Nov 2019	2.632	Nov 2020	2.449	Nov 2021	-		2.449	Continuing	Continuing	Continuing
Fleet Integration - MX09 - Fleet PEO C41	MIPR	PEO C41 : San Diego, CA	2.002	2.002	Nov 2019	1.004	Nov 2020	0.000		-		0.000	0.000	5.008	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MX09 / *Aegis BMD Development Support*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Fleet Integration - MX09 - Fleet SMDC	MIPR	SMDC/ARSTRST : Huntsville, AL	1.909	1.048	Nov 2019	0.629	Nov 2020	0.630	Nov 2021	-		0.630	Continuing	Continuing	Continuing
Fleet Integration - MX09 - LM	C/CPFF	LM : VA	0.000	0.025	May 2020	5.710	Nov 2020	0.000		-		0.000	0.000	5.735	0.000
Fleet Integration - MX09 - Fleet CSCS	MIPR	CSCS : Dahlgren, VA	4.214	1.404	Nov 2019	1.653	Nov 2020	1.653	Nov 2021	-		1.653	Continuing	Continuing	Continuing
Infrastructure Upgrades - Infrastructure Upgrades - MX-09 S Jacobs	C/CPAF	Jacobs Engineering : AL, CA, CO, NM, VA, HI	0.096	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Infrastructure Upgrades - Infrastructure Upgrades MX-09 S Network	C/CPFF	Network Management Resources : Chantilly, VA	0.171	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Infrastructure Upgrades - MX09 - ICT Funding	C/CPAF	Jacobs Engineering : AL,CA,CO,NM,VA,HI	47.602	11.569	Nov 2019	11.662	Nov 2020	11.364	Nov 2021	-		11.364	Continuing	Continuing	Continuing
Infrastructure Upgrades - MX09 - S	MIPR	SPAWAR : CA	0.446	0.000		0.000		0.000		-		0.000	0.000	0.446	0.000
Infrastructure Upgrades - MX09 - S APL	SS/CPAF	JHU/APL : Laurel, MD	1.797	5.160	Nov 2019	0.000		0.000		-		0.000	0.000	6.957	0.000
Infrastructure Upgrades - MX09 - S Corona	MIPR	NSWC Corona : Corona, CA	4.485	0.847	Nov 2019	0.000		0.000		-		0.000	0.000	5.332	0.000
Infrastructure Upgrades - MX09 - S LM	C/CPAF	Lockheed Martin : Moorestown, NJ	20.735	0.894	Nov 2019	0.000		0.000		-		0.000	0.000	21.629	0.000
Infrastructure Upgrades - MX09 - S MIT	C/CPAF	MIT : Lexington, MA	0.958	0.348	Nov 2019	0.000		0.000		-		0.000	0.000	1.306	0.000
Infrastructure Upgrades - MX09 - S RMS	C/CPAF	Raytheon : Tucson, AZ	5.820	1.100	Nov 2019	0.000		0.000		-		0.000	0.000	6.920	0.000
Infrastructure Upgrades - MX09- D/TD	MIPR	SPAWAR : CA	10.171	3.739	Nov 2019	4.387	Nov 2020	0.000		-		0.000	0.000	18.297	0.000
Infrastructure Upgrades - MX09- S DD	MIPR	NSWC DD : Dahlgren, VA	3.543	0.300	Nov 2019	0.000		0.000		-		0.000	0.000	3.843	0.000
Infrastructure Upgrades - MX09-Various	MIPR	Various : Various	0.759	0.820	Nov 2019	0.000		0.000		-		0.000	0.000	1.579	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / *AEGIS BMD*	Project (Number/Name) MX09 / *Aegis BMD Development Support*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Joint Emerging Operational Need (JEON) - Joint Emerging Operational Needs Statement (JEON) - MX09 AW JHU/APL	SS/CPFF	JHU/APL : Columbia, MD	0.480	0.000		0.000		0.000		-		0.000	0.000	0.480	0.000
Joint Emerging Operational Need (JEON) - Joint Emerging Operational Needs Statement (JEON) - MX09 AW Lockheed Martin	C/CPFF	Lockheed Martin : Moorestown, NJ	3.635	0.000		0.000		0.000		-		0.000	0.000	3.635	0.000
Joint Emerging Operational Need (JEON) - Joint Emerging Operational Needs Statement (JEON) - MX09 AW NSWC	MIPR	NSWC DD : Dahlgren, VA	0.685	0.000		0.000		0.000		-		0.000	0.000	0.685	0.000
		Subtotal	527.151	151.772		148.030		136.506		-		136.506	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	527.151	151.772		148.030		136.506		-		136.506	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MX09 / *Aegis BMD Development Support*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MX09 Aegis BMD Development Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MX09 / *Aegis BMD Development Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MX09 Aegis BMD Development Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603892C / *AEGIS BMD*	Project (Number/Name) MD40 / *Program-Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program-Wide Support*	349.658	25.848	30.503	30.095	-	30.095	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency PE's each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	25.848	30.503	30.095
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the STEM program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; the FSRM program (formerly Real Property Maintenance) to keep the Department's			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD40 / *Program-Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	25.848	30.503	30.095

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Operations Management	C/CPAF	Various : Multi: AL, CA, CO, VA	3.239	0.423	Jul 2020	0.000		0.000		-		0.000	0.000	3.662	0.000
Program Wide Support - Agency Operations and Support Civilian Salaries	Various	MDA : Multi: AK, AL, CO, CA, VA	271.494	23.547	Oct 2019	24.791	Oct 2020	30.095	Oct 2021	-		30.095	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Other Agency Services	MIPR	Various : Multi: AK/ AL/CA/CO/HI/MD/ VA/NJ/NY/OCONUS	30.979	0.152	Jan 2020	0.235	Oct 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AL, CA, CO, VA	39.256	1.726	Jul 2020	5.477	Jul 2021	0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Prior year no longer funded in the FYDP	Various	Various : Various	4.690	0.000		0.000		0.000		-		0.000	0.000	4.690	0.000
		Subtotal	349.658	25.848		30.503		30.095		-		30.095	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	349.658	25.848		30.503		30.095		-		30.095	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603892C / *AEGIS BMD*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 0603896C *I Ballistic Missile Defense Command and Control, Battle Management & Communication*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	3,606.989	550.513	645.741	603.448	-	603.448	-	-	-	-	-	-
MD01: *Command & Control, Battle Management, Communications (C2BMC)*	2,349.056	316.770	417.583	380.218	-	380.218	-	-	-	-	-	-
MC01: *Cyber Operations*	30.206	32.649	12.658	10.537	-	10.537	-	-	-	-	-	-
MT01: *C2BMC Test*	354.407	63.395	61.264	65.341	-	65.341	-	-	-	-	-	-
MX01: *Command & Control, Battle Management, Communications (C2BMC) Development Support*	727.785	114.017	128.482	125.086	-	125.086	-	-	-	-	-	-
MD40: *Program-Wide Support*	145.535	23.682	25.754	22.266	-	22.266	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

The decrease from FY 2021 to FY 2022 reflects the following:
- Completion of FY 2021 cruise missile defense Congressional plus up effort
- Space C2 Integration support efforts and C2BMC development and Deployment program office support efficiencies
- Delay in the initiation of L-200 threat mitigation and Robust Post-Interceptor Assessment (PIA)
- Delay in schedule of fielding the site modifications of Combatant Command (CCMD) required Command and Control, Battle Management and Communications (C2BMC) upgrades for two of the three AN/TPY-2 High Altitude Electromagnetic Pulse (HEMP) Hardened Transportable Terminal (HTT) sites
- Completion of US Northern Command (USNORTHCOM) user node
- Completion of the Management Node that provides uninterrupted mission support to geographical separated locations for Ballistic Missile Defense (BMD) network system security
- Completion of upgrade and implementation of DoD required Secure Host Baselines for required operating systems

A. Mission Description and Budget Item Justification

The Command and Control, Battle Management, and Communications (C2BMC) program is the integrating element of the Missile Defense System (MDS). It is a vital operational system that enables the U.S. President, Secretary of Defense and Combatant Commanders at strategic, regional and operational levels to systematically plan missile defense operations, to collectively see the battle develop, and to dynamically manage designated networked sensors and weapons systems to achieve global and regional mission objectives. Systems linked through C2BMC include Patriot, Terminal High Altitude Area Defense (THAAD), Aegis Ballistic Missile Defense (BMD), Aegis Ashore, Ground-based Midcourse Defense (GMD), Army Integrated Air and Missile Defense Battle Command System (IBCS), and sensors such as the

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0603896C *I Ballistic Missile Defense Command and Control, Battle Management & Communication*

Army Navy/Transportable Radar Surveillance and Control-2 (AN/TPY-2) Radar, Sea-Based X-Band Radar (SBX), Long Range Discrimination Radar (LRDR), Homeland Defense, Space-Based Infrared System (SBIRS), and BMDS Overhead Persistent Infrared (OPIR) Architecture (BOA). The C2BMC program also works to increase coalition partners' capabilities and investigates concepts and explores system engineering issues associated with innovative space applications for a missile defense intercept and defeat system. C2BMC begins support to integrate existing sensor elements within Missile Defense Agency and the Services into the Ballistic Missile Defense System Communications Network (BCN) to establish a globally integrated sensor architecture to provide enhanced, dynamic space capabilities, and extend existing BCN network and cybersecurity management to cover the expanded architecture.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	549.756	593.353	593.330	-	593.330
Current President's Budget	550.513	645.741	603.448	-	603.448
Total Adjustments	0.757	52.388	10.118	-	10.118
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-40.965			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	93.353			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-8.404	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	9.161	0.000	10.118	-	10.118

Change Summary Explanation

The increase in FY 2021 provides the enacted congressional net increase of $52.4 million. $50.0 million increase provides for the development of innovative command and control techniques and technology to accelerate integration of non-traditional sensors for missile defense. $36.2 million increase provides for acceleration of indications and warning capability against cruise missiles and asymmetric threats. $5.0 million increase provides for cybersecurity upgrades to protect against the cybersecurity threat environment. $2.2 million increase provides for DWR MDA manpower restoration. $41.0 million reduction reflects the Congressional decrease for Increment 7 and Increment 9 development efforts.

The increase in FY 2022 provides systems engineering activities and algorithm development to support Layered Homeland Defense efforts.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	Project (Number/Name) MD01 / *Command & Control, Battle Management, Communications (C2BMC)*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD01: *Command & Control, Battle Management, Communications (C2BMC)*	2,349.056	316.770	417.583	380.218	-	380.218	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The decrease from FY 2021 to FY 2022 reflects the following:
- Completion of FY 2021 cruise missile defense Congressional plus up effort
- Space C2 Integration support and C2BMC development and Deployment program office support efficiencies
- Delay in the initiation of L-200 threat mitigation and Robust Post-Interceptor Assessment (PIA)
- Delay in schedule of fielding the site modifications of Combatant Command (CCMD) required C2BMC upgrades for two of the three AN/TPY-2 High Altitude Electromagnetic Pulse (HEMP) Hardened Transportable Terminal (HTT) sites
- Completion of USNORTHCOM user node
- Completion of the Management Node that provides uninterrupted mission support to geographical separated locations for Ballistic Missile Defense (BMD) network system security

A. Mission Description and Budget Item Justification

Provides incremental development, deployment, and operational support of C2BMC capabilities required for MDS planning, situational awareness, sensor management, and engagement coordination. The FY 2019 National Defense Authorization Act (NDAA) section 869 recognized C2BMC for its implementation of this iterative practice and directed C2BMC's inclusion in a Community of Practice to advise on agile or iterative development.

C2BMC delivers capabilities incrementally with each software build (named as a Spiral), adding to or enhancing the capability of the previous build. C2BMC incremental delivery of Spiral 8.2 provides critical Homeland Defense for increased GMD battlespace, improved threat tracking using multiple sensors communicating via Link 16, enhanced sensor tasking to meet track quality and discrimination timeliness requirements, Space Domain Awareness (SDA) tasking support, and improved cyber capabilities. Enhanced Homeland Defense also integrates the BMDS Overhead Persistent Infrared (OPIR) Architecture (BOA) with the MDS to enhance system level missile-tracking capabilities through earlier cueing of radars and weapon systems.

European Phased Adaptive Approach (EPAA) Phase 3/Engage-on-Remote (EOR) (Spiral 8.2-3) provides critical sensor management capability, greater engagement flexibility, improved OPIR-based cueing, and enhanced Aegis BMD defended area by enabling Aegis to use Army Navy/Transportable Radar Surveillance and Control-2 (AN/TPY-2) data for EOR engagements, providing a five-fold increase in defended area coverage in the US Central Command (USCENTCOM) and US European Command (USEUCOM) area of responsibility compared to individual weapon system organic capability. Spiral 8.2-3 also includes SDA and integrates Mobile Sensor Integration (MSI) Phase 1 and BOA data into the MDS.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MD01 / *Command & Control, Battle Management, Communications (C2BMC)*

Long Range Discrimination Radar (LRDR) Control for Homeland Defense (Spiral 8.2-5) enables increased homeland and regional defense by providing LRDR sensor management, creation and dissemination of a BMD System track inclusive of LRDR sensor data, hypersonic threat tracking, significant capability expansion of track and reporting Advance Threats for warfighter SDA; implements Link-16 reporting, integration of system level discrimination data, transmission of LRDR-based information to GMD Fire Control (GFC) and other MDS elements; and operationalization of Space-based Kill Assessment (SKA) hit assessment for Homeland Defense.

Expanded Regional and Homeland Defense Increment 7 (Spiral 8.2-7) will provide BMDS System Track (BST) with System Level Discrimination Integration for GMD engagements; Expanded Active Sensor Bias Monitoring and Full Reporting; Refined Space and Intelligence Data; Expanded Hypersonic Tracking and Link-16 Reporting.

Cruise Missile Defense accelerates capabilities against cruise missiles and asymmetric threats by providing performance assessments of advanced cruise missiles, leveraging C2BMC Enterprise Sensor Processing Node (ESPN) to track and report on advanced threats, and establishes a new suite for 24 hours a day, 7 days a week testing of new ground processing algorithms to detect and report on long range cruise missiles. This capability will demonstrate a design with non-traditional sensors and networks, with the potential for limited leave behind capability.

The classified effort will provide the development of innovative command and control (C2) techniques and technology to accelerate integration of non-traditional sensors for missile defense.

Layered Homeland Defense (LHD) provides the Warfighter with the capability to use additional layers of missile defense by developing and testing auto-engagement coordination logic with multiple weapon systems (GMD, Aegis, THAAD). C2BMC provides engagement planning, sensor tasking and resource management, track handling, system discrimination solutions, warfighter decision aids, and integrated battle management allowing multiple engagement opportunities and weapon system deconfliction across the threat flight trajectory.

C2BMC continues to develop incremental improvements to the MDS to keep pace with emerging threats worldwide by investing in the development, integration, and testing of advanced algorithms to improve track and discrimination capabilities and enhancing use of space based sensor data from sources such as the Space Based Infrared System (SBIRS), using the BMDS OPIR architecture. Related disciplines provide development and deployment support to C2BMC system capabilities. In support of Hypersonic Defense, C2BMC will provide contingency capability to demonstrate, develop and deploy a detection and warning for advanced threats. C2BMC continues Protected Anti-Jam/Anti-Scintillation Wideband Net-Centric System (PAAWNS) modem integration, installations, and technical refresh globally of the threat based communication network modernization against the advanced threat, while maintaining efficiencies in cost.

C2BMC International Partner system engineering ensures allies and partners are integrated to the fullest extent possible with U.S. MDS capabilities. Collaborative system engineering, testing, and fielding facilitate interoperability with North Atlantic Treaty Organization (NATO) and partner nations such as Israel and Japan. C2BMC works with these nations to define and document international interfaces that are compatible with international standards and traceable to U.S. MDS requirements. C2BMC participates in test events and live fire exercises hosted by international partners to ensure U.S. missile defense weapons, sensors, and C2 systems are

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MD01 / *Command & Control, Battle Management, Communications (C2BMC)*

interoperable with international systems. C2BMC maintains and upgrades the U.S./NATO secure data sharing gateways located at Ramstein Air Base, Germany, for missile defense operations and training. C2BMC also supports development of Japan's BMD requirements to ensure interoperability of Japanese and U.S. BMD systems (sensors, shooters, C2) resulting in an integrated regional, operational, and strategic defense of Japan.

C2BMC Modeling and Simulation (M&S) maintains MDS simulation/stimulation tools and federated models to support development and verification of deployed C2BMC and BOA Spirals. The BMDS C2BMC Model (BCM) is used for Flight Test pre-mission analysis and exercises to represent a second C2 Suite for Cross-Area of Responsibility (XAOR) functionality, Early Digital Product (EDP) for C2BMC performance assessment, and supports development and integration of GMD, AN/TPY-2, and Aegis software and models. The OPIR sensor M&S is used in the Ground Test Integrated System-level Simulation (GTISS) as the stimulus for BOA. The BCM program provides a cost effective means to assess and explore the performance space of the MDS beyond what can be physically tested via Flight Tests and Target of Opportunity collections.

C2BMC develops, integrates, and tests advanced algorithms to improve discrimination capabilities and enhance the use of space-based sensor data. In support of MDA's discrimination improvements effort, C2BMC demonstrates, develops, and deploys multiple techniques to improve BMD System ability to identify lethal and non-lethal objects.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: C2BMC Development and Deployment	286.176	291.890	305.210
Articles:	-	-	-
Description: Provides funding for incremental development and deployment of C2BMC capabilities that link sensors and shooters to enable integrated MDS capabilities, integrate BOA with the MDS architecture to enhance missile tracking capabilities and enable much earlier cueing of radars and shooters, and fulfill Cybersecurity requirements. The Enterprise Sensors Laboratory (ESL) and Experimentation Laboratory (X-Lab) produce key prototypes for further maturation in the C2BMC capability Spiral development process and enable integrated experimentation for C2BMC, ESL, OPIR products, and other MDS elements through robust connectivity to simulation frameworks, weapon systems, sensors, and operational assets. Expand capability to track and report Advanced Threats for warfighter Situational Awareness. Expanding Space Domain Awareness (SDA) tasking and reporting to include TPY2, LRDR, and Aegis sensors. Recurring accomplishments include iterative development and procurement cycles for hardware, software, network capability system engineering tasks, and artifacts for technical engineering reviews; participation in test readiness reviews, pre-test engineering, and analysis of ground and flight test results, wargames, and exercises in accordance with the MDS Integrated Master Test Plan (IMTP); site planning, scheduling, and hardware acquisition to support planned deployment of C2BMC Spirals and BOA capabilities; updates and maintenance for C2BMC Model (BCM) MDS simulation/stimulation (federated model) and verification scenarios for all C2BMC Spirals deployed and under development; Discrimination, operationalization of SKA Hit Assessment, and C2BMC capabilities; design and installation of operational sharing gateways; and collaboration with international			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MD01 / *Command & Control, Battle Management, Communications (C2BMC)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
partners to ensure future interoperability; and maintain Verification and Validation in support of MDS capability ground testing and participation in MDS ground tests. C2BMC will continue design and prototype of next incremental capability addressing Additional Homeland Defense and Mid-Term Discrimination requirements to receive and utilize initial Advanced Discrimination data from LRDR, inclusive of C2BMC Generation of BMD System Track (with System Level Discrimination Data Integration) for GMD Homeland Defense Engagements and Expanded Regional and Homeland Defense, exploit additional OPIR data via BOA, enhanced Aegis BMD engage on capability, and expanded hypersonic defense tracking and reporting. C2BMC will begin to integrate existing MDA and Service elements with C2BMC and the Ballistic Missile Defense System Communications Network (BCN) to establish a globally integrated sensor architecture to provide enhanced, dynamic space capabilities, and extend existing BCN network and cybersecurity management to cover the expanded architecture. The expanded sensor architecture will integrate ground-based radars from the U.S. Space Force Space Surveillance Network (SSN), orchestrated by C2BMC, and develop algorithms to fuse and/or correlate the data provided by these sensors in support of missile defense and space C2 missions. Specific and/or unique accomplishments for each FY are as follows: ***FY 2021 Plans:*** EPAA Phase 3 / EOR (Spiral 8.2-3): - Continue maintenance of Spiral 8.2-3's ability to develop/deploy capability in response to emergent operational requirements LRDR for Homeland Defense (Spiral 8.2-5), homeland defense focus: - Continue incremental capability development for S8.2-5 in response to emergent operational requirements - Support developmental testing and preparation of transfer of the LRDR to the Air Force - Continue phased deployment of hardware and software to provide LRDR MDS network connectivity and sensor control nodes - Continue development, integration, and operationalization of BOA 7.0 capability to detect and track advanced threats globally - Continue operationalization of Space-based Kill Assessment (SKA) Hit Assessment (HA) C2BMC Additional and Expanded Regional and Homeland Defense focus: - Continue design and development of, and deliver accredited models and simulations (M&S) for, C2BMC and BOA spirals for participation in End-to-end Digital Integrated System Simulation (EDISS) - Support two training device development program for distributed and individual training			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MD01 / *Command & Control, Battle Management, Communications (C2BMC)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Continue to support the design and development of Ground Test Integrated System-level Simulation (GTISS) by developing and delivering accredited M&S for BOA spirals - Initiate development of next iteration of BOA which will include addition of new sensors and expanded Advanced Threat Performance - Initiate early technology development to integrate additional advanced sensors into BOA to expand coverage and increase custody of emerging threats - Initiate Management Node to provide uninterrupted mission support by providing geographical separated locations for BMD network and system security - Initiate and complete user node to USNORTHCOM as a Warfighter Involvement Process (WIP) item providing hardware and integration to support Homeland Defense - Initiate integration of sensor elements to provide enhanced, dynamic space capabilities and extend existing Ballistic Missile Defense System Communications Network (BCN) and cybersecurity management to cover expanded architecture - Initiate technical upgrade and refresh for development lab infrastructure and the Joint Early Warning Lab (JEWL) - Perform cybersecurity upgrades to the C2BMC development environment Space C2 Sensor Integration - Establish early connectivity to Eglin C-Band Radar, Millstone, ALTAIR, and Space Fence SSN sensors through existing network paths to conduct early opportunity integration and Joint risk reduction testing with the U.S. Space Force - Initiate BCN connectivity process between C2BMC and the above SSN sensors, as well as the Ground-Based Radar-Kwajalein (GBR-K) radar - Expand C2BMC architecture to support C2BMC Global tasking of SSN sensors - Initiate software development to integrate and test SSN sensors as part of S8.2-5 spiral development - Conduct studies to evaluate and optimize trades in support of delivering integrated Space C2 and missile defense capabilities			
FY 2022 Plans: LRDR for Homeland Defense (Spiral 8.2-5), homeland defense focus: - Complete incremental capability development for S8.2-5 in response to emergent operational requirements - Complete phased deployment of hardware and software to provide LRDR MDS network connectivity and sensor control nodes - Complete development, integration, and operationalization of BOA 7.0 capability to detect and track advanced threats globally - Complete development and testing of Space-based Kill Assessment (SKA) Hit Assessment (HA) - Begin sustainment of S8.2-5 capabilities C2BMC Additional and Expanded Regional and Homeland Defense focus:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MD01 / *Command & Control, Battle Management, Communications (C2BMC)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Continue design and development of, and deliver accredited models and simulations (M&S) for, C2BMC and BOA spirals for participation in End-to-end Digital Integrated System Simulation (EDISS) - Support two training device development and fielding programs for distributed and individual training - Continue to support the design and development of Ground Test Integrated System-level Simulation (GTISS) by developing and delivering accredited M&S for BOA spirals - Continue development of next iteration of BOA which will include addition of new sensors and expanded Advanced Threat Performance - Continue development to integrate additional advanced sensors into BOA to expand coverage and increase custody of emerging threats - Initiate integration of sensor elements to provide enhanced, dynamic space capabilities and extend existing Ballistic Missile Defense System Communications Network (BCN) and cybersecurity management to cover expanded architecture - Continue technical upgrade and refresh for development lab infrastructure and the Joint Early Warning Lab (JEWL) C2BMC Layered Homeland Defense focus: - Begin system engineering activities to support Layered Homeland Defense including requirements, design, and operational concept development - Start algorithm development to support enhanced engagement planning, battle management, and decision aids Space C2 Integration - Initiate development and test of source and system track algorithms in support of Space C2 sensor orchestration - Continue development, integration, and test of the Eglin C-Band Radar, Millstone, ALTAIR, Space Fence, and GBR-K sensors into C2BMC - Initiate development of Space Domain Awareness sensor integration of a UEWR sensor in support of Joint Space C2/MD missions - Support interface development and test for the Millstone, ALTAIR, Space Fence, Eglin C-Band, and UEWR radars as their U.S. Space Force upgrade paths near IOC - Initiate early operational testing of the above SSN sensors with C2BMC serving as the sensor orchestrator and track processor - Conduct studies to evaluate and optimize trades in support of delivering integrated Space C2 and missile defense capabilities ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase in FY 2022 provides systems engineering activities and algorithm development to support Layered Homeland Defense efforts.			
Title: C2BMC Communications	30.594	39.493	35.265

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MD01 / *Command & Control, Battle Management, Communications (C2BMC)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Articles:	-	-	-

Description: The BMD Communications Network (BCN) ties together an expanding set of sensors and weapons systems to enable the National Command Authority and the commanders at the strategic, theater, and tactical levels to optimally engage missile threats. Recurring accomplishments include the following:
- Provide GMD Communications Network (GCN) Long Haul Communications Transport (LHCT) services and a robust, end-to-end, high availability, operational communications network (COMNET) infrastructure with diverse paths that quickly and unambiguously share information across the global MDS
- Participate in and analyze results from events scheduled in the MDS IMTP
- Provide MDS communications via leased Defense Information Service Agency (DISA) circuits, and resolve real-time operational issues through DISA's Network Operations and Security Center
- Provide effective network management to coordinate and integrate information across diverse equipment platforms, interface with other DoD communications systems, evolve information standards and capabilities, and adhere to the DoD Risk Management Framework (RMF)
- Upgrade BCN capability by supporting all DoD teleports to enhance satellite communications
- Continue technical refresh for End-of-Life SATCOM terminals on SBX by transitioning to Military Satellite Communications (MILSATCOM) terminals
- Continue acquiring additional network circuits to support the threat based communication network modernization
- Continue PAAWNS modem integration and installations globally

Specific and/or unique accomplishments for each FY are as follows:

FY 2021 Plans:
- Complete installation of long distance circuit hardware for the Ground-Based Midcourse Defense Communication Network Modernization
- Continue acquiring additional network circuits to support the threat based communication network modernization
- Continue PAAWNS modem integration and installations globally
- Upgrade and technical refresh of the PAAWNS threat based communication network against the advanced threat of nuclear capabilities, while maintaining efficiencies in cost
- Upgrade and integrate AN-TPY/2 High Altitude Electromagnetic Pulse (HEMP) Hardened Transportable Terminals (HTT) for increased protection of satellite communication systems at relevant sites

FY 2022 Plans:

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MD01 / *Command & Control, Battle Management, Communications (C2BMC)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Continue upgrade and technical refresh of the PAAWNS threat based communication network against the advanced threat of nuclear capabilities, while maintaining efficiencies in cost - Continue upgrade and integration of AN-TPY/2 HEMPHTTs for increased protection of satellite communication systems at relevant sites ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects a delay in schedule of fielding site modifications of Combatant Command (CCMD) required C2BMC upgrades for AN/TPY-2 HEMP HTT sites.			
Title: Classified ***Articles:*** ***Description:*** Provides for the development of innovative command and control techniques and technology to accelerate integration of non-traditional sensors for missile defense. Leverage advanced processing nodes, innovative fusion techniques, and advanced capabilities for enhanced tracking and reporting. Specific and/or unique accomplishments for each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE ***FY 2022 Plans:*** - SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The decrease from FY 2021 to FY 2022 reflects the completion of Classified Congressional plus up efforts planned in FY 2021.	0.000 -	50.000 -	39.743 -
Title: Cruise Missile Defense for Homeland ***Articles:*** ***Description:*** Accelerates capability against cruise missiles and asymmetric threats. Provides performance assessment of advanced cruise missiles, leverages Command and Control, Battle Management, and Communications Enterprise Sensor Processing. Node to track and report on advanced threats, and establishes a new suite for 24 hours a day, 7 days a week, 365 days a year testing of new ground processing algorithms to detect and report on long range cruise missiles, and will demonstrate a design with non-traditional sensors and networks, with the potential for limited leave behind capability. Specific and/or unique accomplishments for each FY are as follows:	0.000 -	36.200 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MD01 / *Command & Control, Battle Management, Communications (C2BMC)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
FY 2021 Plans: - SEE ABOVE ***FY 2022 Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The decrease from FY 2021 to FY 2022 reflects the completion of FY 2021 Cruise Missile Defense Congressional plus up efforts.			
Accomplishments/Planned Programs Subtotals	316.770	417.583	380.218

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603881C: *Ballistic Missile Defense Terminal Defense Segment*	295.312	312.317	277.949	-	277.949	-	-	-	-	-	-
• 0603882C: *Ballistic Missile Defense Midcourse Defense Segment*	1,275.414	1,219.261	745.144	-	745.144	-	-	-	-	-	-
• 0603884C: *Ballistic Missile Defense Sensors*	348.356	265.803	224.750	-	224.750	-	-	-	-	-	-
• 0603890C: *BMD Enabling Programs*	630.196	616.455	595.301	-	595.301	-	-	-	-	-	-
• 0603892C: *AEGIS BMD*	722.582	877.336	732.512	-	732.512	-	-	-	-	-	-
• 0603904C: *Missile Defense Integration and Operations Center (MDIOC)*	54.783	55.356	52.403	-	52.403	-	-	-	-	-	-
• 0603907C: *Sea Based X-Band Radar (SBX)*	137.604	118.318	147.241	-	147.241	-	-	-	-	-	-
• 0603914C: *Ballistic Missile Defense Test*	398.939	365.208	362.906	-	362.906	-	-	-	-	-	-
• 0603915C: *Ballistic Missile Defense Targets*	545.764	536.133	553.334	-	553.334	-	-	-	-	-	-
• 0604181C: *Hypersonic Defense*	386.528	272.632	247.931	-	247.931	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MD01 / *Command & Control, Battle Management, Communications (C2BMC)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0604672C: *Homeland Defense Radar-Hawaii*	181.569	133.000	0.000	-	0.000	-	-	-	-	-	-
• 0604673C: *Pacific Discriminating Radar*	2.921	0.000	0.000	-	0.000	-	-	-	-	-	-
• 0604873C: *Long Range Discrimination Radar (LRDR)*	131.135	138.317	133.335	-	133.335	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

A sole source C2BMC contract to Lockheed Martin was awarded 1st quarter FY 2012. The current ordering period is through 1st quarter FY 2025. Major team members to Lockheed are Northrop Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, testing, fielding, training, operations and sustainment, and cyber operations support of the C2BMC system. Additionally, the Defense Information Systems Agency (DISA) supports C2BMC worldwide long-haul communications. C2BMC Program Office government, Federally Funded Research and Development Center/University Affiliated Research Center (FFRDC/UARC), and Contract Support Services (CSS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment. Furthermore, a sole source contract Specialized Warfighter Development Contract (SWDC) was awarded to Northrop Grumman in March 2018 (3 year base and 2 one year option periods) for continuation of the systems engineering, software development, test and integration for BMDS Overhead Persistent Infrared Architecture (BOA) and Simultaneous Correlation of Unambiguous Tracks (SCOUT).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MD01 / *Command & Control, Battle Management, Communications (C2BMC)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C2BMC Development and Deployment - Independent Performance Assessment and Analysis -Various	MIPR	Various : Huntsville, AL, Colorado Springs, CO; NCR	5.600	3.365	Oct 2019	4.449	Oct 2020	1.886	Oct 2021	-		1.886	Continuing	Continuing	Continuing
C2BMC Development and Deployment - Aggregated Discrim	Various	Various : AL; CO; FL; OH; MA; VA	38.308	15.543	Oct 2019	27.321	Oct 2020	12.443	Oct 2021	-		12.443	Continuing	Continuing	Continuing
C2BMC Development and Deployment - BMDS C2BMC Model (BCM) - EDISS Integration	SS/CPIF	Lockheed Martin : Huntsville, AL, Colorado Springs, CO; NCR	0.000	9.186	Oct 2019	2.995	Oct 2020	3.797	Oct 2021	-		3.797	Continuing	Continuing	Continuing
C2BMC Development and Deployment - BOA OPIR Stimulation M&S - EDISS/ GTISS	C/CPAF	SciTec : Newark, NJ	0.500	0.083	Oct 2019	2.632	Oct 2020	2.575	Oct 2021	-		2.575	Continuing	Continuing	Continuing
C2BMC Development and Deployment - BOA OPIR Stimulation M&S - EDISS/ GTISS -GOV	MIPR	Sandia National Labs : Albuquerque, NM	1.317	0.928	Nov 2019	0.704	Nov 2020	0.000		-		0.000	0.000	2.949	0.000
C2BMC Development and Deployment - BOA OPIR Stimulation M&S - EDISS/ GTISS -NGC	SS/CPAF	Northrop Grumman Space and Mission Systems : Azusa, CA	1.615	3.467	Nov 2019	0.687	Nov 2020	0.000		-		0.000	0.000	5.769	0.000
C2BMC Development and Deployment - BOA Simulation Development and Integration- EDISS	SS/CPAF	Northrop Grumman Space and Mission Systems : Boulder, CO	0.000	0.000		0.687	Oct 2020	0.000		-		0.000	0.000	0.687	0.000
C2BMC Development and Deployment - C2BMC Hardware/Software Development, Integration & Test (I&T)	SS/CPIF	Lockheed Martin Team : Huntsville, AL; Colorado Springs, CO	877.374	112.597	Dec 2019	124.499	Dec 2020	130.327	Dec 2021	-		130.327	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MD01 / *Command & Control, Battle Management, Communications (C2BMC)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C2BMC Development and Deployment - C2BMC Integration	MIPR	Aviation and Missile Research Development and Engineering Center : Huntsville, AL	168.709	7.918	Nov 2019	2.577	Nov 2020	7.263	Nov 2021	-		7.263	Continuing	Continuing	Continuing
C2BMC Development and Deployment - C2BMC Mid-Term Discrim-SCOUT	SS/CPFF	Northrop Grumman Space and Mission Systems : Huntsville, AL	50.228	5.331	Oct 2019	0.000		0.000		-		0.000	0.000	55.559	0.000
C2BMC Development and Deployment - C2BMC Mid-Term Discrim-SCOUT OGA	MIPR	Aviation and Missile Research Development and Engineering Center : Huntsville, AL	4.330	2.500	Nov 2019	0.224	Nov 2020	0.000		-		0.000	0.000	7.054	0.000
C2BMC Development and Deployment - Contract Support Services (CSS)	C/CPFF	MDA Various : Huntsville, AL; Colorado Springs, CO; NCR	306.047	34.092	Nov 2019	28.599	Nov 2020	25.375	Nov 2021	-		25.375	Continuing	Continuing	Continuing
C2BMC Development and Deployment - Cybersecurity Upgrades - Development	SS/CPIF	Lockheed Martin : Huntsville, AL; Colorado Springs, CO	0.000	0.000		4.968	Jan 2021	0.000		-		0.000	0.000	4.968	0.000
C2BMC Development and Deployment - ESL/BOA Development	SS/CPAF	Northrop Grumman Space and Mission Systems : Colorado Springs, CO	48.655	5.000	Oct 2019	28.411	Oct 2020	24.215	Oct 2021	-		24.215	Continuing	Continuing	Continuing
C2BMC Development and Deployment - Federally Funded Research & Development Centers / University Affiliated Research Center	MIPR	MITRE, IDA, ORNL, Aerospace, JHU/APL, GTRI : Arlington, VA/ Huntsville, AL/ Colorado Springs, CO	200.722	16.210	Oct 2019	17.239	Oct 2020	15.368	Oct 2021	-		15.368	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MD01 / *Command & Control, Battle Management, Communications (C2BMC)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C2BMC Development and Deployment - IT User Services - IRES	C/CPAF	Jacobs Technical, Inc : AL, AK, CA, CO, HI, NM, VA	1.922	6.008	Mar 2020	6.216	Mar 2021	6.057	Mar 2022	-		6.057	Continuing	Continuing	Continuing
C2BMC Development and Deployment - IT User Services - NGC	SS/CPFF	Northrop Grumman Space and Mission Systems : Colorado Springs, CO	9.266	0.000		0.000		0.000		-		0.000	0.000	9.266	0.000
C2BMC Development and Deployment - Independent Performance Assessment and Analysis	MIPR	Aviation and Missile Research Development and Engineering Center : Huntsville, AL	10.112	0.000		1.020	Nov 2020	0.865	Nov 2021	-		0.865	Continuing	Continuing	Continuing
C2BMC Development and Deployment - Joint Early Warning Lab (JEWL) and C2BMC Lab Build Out	C/CPAF	Jacobs Technical, Inc : Colorado Springs, CO	1.239	6.456	Mar 2020	3.680	Mar 2021	1.019	Mar 2022	-		1.019	Continuing	Continuing	Continuing
C2BMC Development and Deployment - Layered Homeland Defense (Prime)	SS/CPIF	Lockheed Martin : Huntsville, AL	0.000	0.000		0.000		20.634	Nov 2021	-		20.634	Continuing	Continuing	Continuing
C2BMC Development and Deployment - Layered Homeland Defense - Contract Support Services (CSS)	C/CPFF	MDA Various : Huntsville, AL; Colorado Springs, CO; NCR	0.000	0.000		0.000		6.082	Nov 2021	-		6.082	Continuing	Continuing	Continuing
C2BMC Development and Deployment - Layered Homeland Defense Planner	MIPR	Aviation and Missile Research Development and Engineering Center : Huntsville, AL	0.000	0.000		0.000		4.634	Nov 2021	-		4.634	Continuing	Continuing	Continuing
C2BMC Development and Deployment - Layered Homeland Defense Prototyping	C/CPFF	Corvid : Huntsville, AL	0.000	0.000		0.000		13.628	Nov 2021	-		13.628	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MD01 / *Command & Control, Battle Management, Communications (C2BMC)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C2BMC Development and Deployment - M&S EDISS/ GTISS - Industry	C/CPAF	Boeing : Huntsville, AL	0.000	4.064	Dec 2019	0.000		0.000		-		0.000	0.000	4.064	4.064
C2BMC Development and Deployment - MDA Civilian, Travel & PCS	Various	MDA Various : Huntsville, AL; Colorado Springs, CO; NCR	188.714	20.027	Oct 2019	23.477	Oct 2020	20.919	Oct 2021	-		20.919	Continuing	Continuing	Continuing
C2BMC Development and Deployment - Mobile Sensor Integration Phase II	Various	Various : AL; CO; FL; OH; MA; VA	33.500	0.000		0.000		0.000		-		0.000	0.000	33.500	0.000
C2BMC Development and Deployment - Models & Simulation	SS/CPIF	Lockheed Martin Team : Huntsville, AL; Colorado Springs, CO; NCR	5.861	8.021	Oct 2019	5.367	Oct 2020	3.720	Oct 2021	-		3.720	Continuing	Continuing	Continuing
C2BMC Development and Deployment - OGA Communications Development	MIPR	USAF/SAF : Various	0.000	14.389	May 2020	0.000		0.000		-		0.000	0.000	14.389	0.000
C2BMC Development and Deployment - Post Intercept Assessment	C/CPFF	SciTec : Newark, NJ	2.105	1.578	Nov 2019	0.500	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing
C2BMC Development and Deployment - Post Intercept Assessment Hardware	C/CPAF	Northrop Grumman Space and Missile Systems : Colorado Springs, CO	0.713	0.000		0.000		0.000		-		0.000	0.000	0.713	0.000
C2BMC Development and Deployment - Post Intercept Assessment Integration	SS/CPIF	Lockheed Martin Team : Huntsville, AL/Colorado Springs, CO	0.359	0.872	Nov 2019	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
C2BMC Development and Deployment - Post Intercept Assessment Prototyping	C/CPFF	Corvid : Huntsville, AL	6.028	2.220	Nov 2019	0.000		0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MD01 / *Command & Control, Battle Management, Communications (C2BMC)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
C2BMC Development and Deployment - Prior year C2BMC Development and Deployment no longer funded in the FYDP	Various	Various : Various	1.000	0.000		0.000		0.000		-		0.000	0.000	1.000	0.000
C2BMC Development and Deployment - Specialized Warfighter Development Program Management	SS/CPAF	Northrop Grumman Space and Mission Systems : Huntsville, AL	3.390	2.540	Mar 2020	3.436	Mar 2021	0.000		-		0.000	0.000	9.366	0.000
C2BMC Development and Deployment - Spiral Development	MIPR	Sandia, MDA Various : AL; CA; CO; NCR, NM	8.259	0.221	Oct 2019	2.202	Oct 2020	0.575	Oct 2021	-		0.575	Continuing	Continuing	Continuing
C2BMC Development and Deployment - X Lab	SS/CPIF	Lockheed Martin : Huntsville, AL	7.944	3.560	Oct 2019	0.000		3.828	Oct 2021	-		3.828	Continuing	Continuing	Continuing
C2BMC Communications - Communication Equipment and Fielding	MIPR	DISA, PMDCATS, SPAWAR : Springfield, VA	160.944	23.995	Jan 2020	28.417	Jan 2021	30.459	Jan 2022	-		30.459	Continuing	Continuing	Continuing
C2BMC Communications - Communication Leases	MIPR	DISA : Arlington, VA	58.778	6.599	Oct 2019	11.076	Oct 2020	4.806	Oct 2021	-		4.806	Continuing	Continuing	Continuing
C2BMC Communications - Networks Development and Deployment	SS/CPFF	Lockheed Martin Team : Colorado Springs, CO	28.498	0.000		0.000		0.000		-		0.000	0.000	28.498	0.000
C2BMC Communications - Prior year C2BMC Communications no longer funded in the FYDP	Various	Various : Various	117.019	0.000		0.000		0.000		-		0.000	7.115	124.134	0.000
Classified - Classified Program	MIPR	USAF/SAF : Various	0.000	0.000		50.000	Feb 2021	39.743	Feb 2022	-		39.743	0.000	89.743	0.000
Cruise Missile Defense for Homeland - Cruise Missile Defense for Homeland	MIPR	USAF/SAF : Various	0.000	0.000		36.200	Jan 2021	0.000		-		0.000	0.000	36.200	0.000
		Subtotal	2,349.056	316.770		417.583		380.218		-		380.218	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MD01 / *Command & Control, Battle Management, Communications (C2BMC)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks															
N/A															

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2,349.056	316.770		417.583		380.218		-		380.218	Continuing	Continuing	N/A

Remarks

Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.

Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MD01 / *Command & Control, Battle Management, Communications (C2BMC)*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD01 Command & Control, Battle Management, Communications (C2BMC)	✦	✦	✦	✦																								
MD01 Command & Control, Battle Management, Communications (C2BMC) Planned					✧	✧	✧	✧	✧	✧	✧	✧																
Spiral 8.2-5 Homeland Defense Capability Declaration USNORTHCOM/USINDOPACOM									△																			

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MD01 / *Command & Control, Battle Management, Communications (C2BMC)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD01 Command & Control, Battle Management, Communications (C2BMC)	1	2020	4	2020
MD01 Command & Control, Battle Management, Communications (C2BMC) Planned	1	2021	4	2022
Spiral 8.2-5 Homeland Defense Capability Declaration USNORTHCOM/ USINDOPACOM	1	2022	1	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	Project (Number/Name) MC01 / *Cyber Operations*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MC01: *Cyber Operations*	30.206	32.649	12.658	10.537	-	10.537	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2021 to FY 2022 reflects completion of upgrade and implementation of DoD required Secure Host Baselines for required operating systems, realignment of cybersecurity upgrades to the C2BMC development environment to MD01 Development and Deployment, and realignment of upgrades and implementation of latest DoD required ACAS (Assured Compliance Assessment Solution), ESS (Endpoint Security Services) and Cyber Security increments within the C2BMC Test Bed (CTB) to MT01 Integrated Master Test Plan.

A. Mission Description and Budget Item Justification

Command and Control, Battle Management, and Communications (C2BMC) Cyber Operations sustain the Missile Defense Agency (MDA) Risk Management Framework (RMF) and Security Controls Assessments (SCA)/Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments, and reviews of proposed Program Manager/Information System Security Manager (PM/ISSM) Plan of Action and Milestones (POA&Ms) and Cybersecurity Tools for MDA C2BMC mission systems. Activities in this Project are necessary to comply with the Federal Information Systems Modernization Act (FISMA).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Network / System Certification and Accreditation (C&A)	32.649	12.658	10.537
Articles:	-	-	-
Description: This activity maintains the Assessment and Authorization (A&A) and Certification and Accreditation (C&A) data repository, capturing the RMF documentation (artifacts, validation results, Information Assurance Risk Assessment results, and Authorizing Official (AO) accreditation decisions) and Plan of Action and Milestones (POA&Ms) on all Missile Defense Agency (MDA) information systems. This activity prepares and submits C&A documentation and accreditation recommendations to the MDA Chief Information Officer (CIO) / Security Controls Assessor and the AO. Leverages Cross Domain Solution (CDS) as single authority implementing standard security policies for C2BMC across the BMDS. Independent Verification and Validation team actions ensure the availability, integrity, authentication, confidentiality, and non-repudiation of the MDA mission, test, and administrative systems. - Conduct cybersecurity design, engineering, and architecture planning for C2BMC information technology systems - Plan and test the cybersecurity controls for C2BMC systems - Conduct Security Controls Assessment testing continuous monitoring of C2BMC mission systems and provide POA&Ms to mitigate cybersecurity vulnerabilities			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MC01 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Specific and/or unique accomplishments for each FY are as follows: ***FY 2021 Plans:*** - Complete upgrade and implementation of DoD required Secure Host Baselines for required operating systems - Maintain Cyber posture with operating system and partial hardware refresh ***FY 2022 Plans:*** - Maintain Cyber posture and support next Increment cyber integration, testing, and fielding into operations - Support Agile and Development Operations (DevOps) development with cyber integration - Develop Advanced Persistent Threat and Heuristics capabilities with Tier 2 Cybersecurity Service Provider (CSSP) ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects completion of upgrade and implementation of DoD required Secure Host Baselines for required operating systems, realignment of cybersecurity upgrades to the C2BMC development environment to MD01 Development and Deployment, and realignment of upgrades and implementation of latest DoD required ACAS (Assured Compliance Assessment Solution), ESS (Endpoint Security Services) and Cyber Security increments within the C2BMC Test Bed (CTB) to MT01 Integrated Master Test Plan.			
Accomplishments/Planned Programs Subtotals	32.649	12.658	10.537

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

A sole source C2BMC contract to Lockheed Martin was awarded 1st quarter FY 2012. The current ordering period is through 1st quarter FY 2025. Major team members to Lockheed are Northrop Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, testing, fielding, training, operations and sustainment, and cyber operations support of the C2BMC system. Additionally, the Defense Information Systems Agency (DISA) supports C2BMC worldwide long-haul communications. C2BMC Program Office government, Federally Funded Research and Development Center/University Affiliated Research Center (FFRDC/UARC), and Contract Support Services (CSS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment. Furthermore, a sole source contract Specialized Warfighter Development Contract (SWDC) was awarded to Northrop Grumman in March 2018 (3 year base and 2 one year option periods) for continuation of the systems engineering, software development, test and integration for BMDS Overhead Persistent Infrared Architecture (BOA).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MC01 / *Cyber Operations*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Network / System Certification and Accreditation (C&A) - Civ Cyber Labor	Various	MDA Other : Various	1.443	0.420	Oct 2019	0.531	Oct 2020	0.620	Oct 2021	-		0.620	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Consolidated Contractor Support	Various	MDA : Huntsville, AL; Colorado Springs, CO, NCR	2.321	1.431	Oct 2019	1.329	Oct 2020	1.212	Oct 2021	-		1.212	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Core C2BMC	SS/CPAF	Lockheed Martin : Colorado Springs, CO / Huntsville, AL	13.047	19.615	Jan 2020	7.276	Oct 2020	8.124	Oct 2021	-		8.124	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - IA/ CND Network/System C&A	MIPR	Army, Air Force : Various	6.331	0.000		0.000		0.000		-		0.000	0.000	6.331	0.000
Network / System Certification and Accreditation (C&A) - Information Assurance	C/CPAF	Jacobs Technology : Colorado Springs, CO	6.177	6.519	Mar 2020	3.382	Oct 2020	0.000		-		0.000	0.000	16.078	0.000
Network / System Certification and Accreditation (C&A) - Lab Infrastructure	SS/CPAF	Northrop Grumman : Colorado Springs, CO	0.887	4.664	Mar 2020	0.140	Oct 2020	0.581	Oct 2021	-		0.581	Continuing	Continuing	Continuing
		Subtotal	30.206	32.649		12.658		10.537		-		10.537	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	30.206	32.649		12.658		10.537		-		10.537	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	Project (Number/Name) MC01 / *Cyber Operations*	

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MC01 / *Cyber Operations*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MC01 Cyber Operations	✦	✦	✦	✦																								
MC01 Cyber Operations Planned					✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MC01 / *Cyber Operations*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MC01 Cyber Operations	1	2020	4	2020
MC01 Cyber Operations Planned	1	2021	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	Project (Number/Name) MT01 / *C2BMC Test*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MT01: *C2BMC Test*	354.407	63.395	61.264	65.341	-	65.341	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Increase from FY 2021 to FY 2022 provides upgrades and implementation of latest DoD required ACAS (Assured Compliance Assessment Solution), ESS (Endpoint Security Services), movement of Cyber Security increments within the C2BMC Test Bed (CTB) from budget project MC01 to align with the Financial Management Regulation (FMR) definition of cyber testing, and additional flight/ground test support.

A. Mission Description and Budget Item Justification

Command and Control, Battle Management and Communications (C2BMC) Test supports system flight and ground testing, wargames, and exercises as detailed in the Missile Defense Agency (MDA) Integrated Master Test Plan (IMTP) to ensure C2BMC capabilities delivered are consistent with the Prioritized Capabilities List and are interoperable with other Missile Defense System (MDS) components.

MDA gains efficiencies and minimizes laboratory resource requirements (footprint, personnel, and hardware) by utilizing the C2BMC test bed and the Overhead Persistent Infrared Architecture (OPIR) Capabilities Lab test infrastructure as the laboratory environment supporting System Test, Development, and Sustainment. For System Ground and Flight Test, the labs are used for pre-test analysis, test execution, and post-test analysis. For Development, the labs are utilized for software verification and validation testing and system integration testing. For Sustainment, the labs are used to assist with root cause determination for issues discovered on the fielded system and validation of any required software patches.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Integrated Master Test Plan	63.395	61.264	65.341
Articles:	-	-	-
Description: This activity funds C2BMC participation in MDS flight and ground testing, wargames and exercises, and resources in accordance with the MDS IMTP. Recurring accomplishments include: Test Execution - Assess MDS interoperability, integration, and functionality in lab and distributed environments, leveraging a complex set of scenarios to test the limits of the C2BMC system. Participate in and analyze results of ground tests and flight tests in accordance with the MDS IMTP. Support all phases of the MDA Ground Test Concept of Operations (CONOPS) and the MDA Flight Test CONOPS. Provide Flight Test Predictive Analysis support. Generate, test, and distribute federated model compatible scenarios for Ground Test and Flight Test Experimentation test support. Use BMDS C2BMC Model (BCM) to support exercise integration testing activities including test case and scenario checkout.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MT01 / *C2BMC Test*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Utilize the Enterprise Sensors Laboratory (ESL) to plan, coordinate, and provide test operations to demonstrate prototype algorithms through flight tests and United States-launched targets of opportunity. The development plans for algorithm improvements focus on track and measurement level sensor data fusion and feature extraction to improve 3-D track formation utilizing a variety of space, airborne, and terrestrial-based sensors. Results from the tests and experiments are provided back to the algorithms development activity to enable algorithm refinement. - Continue LRDR node integration, testing, and training with new C2BMC Spiral 8.2-5 Homeland Defense baseline changes at the Missile Defense Integration and Operation Center (MDIOC). Retain Existing Sensor Data Interfaces and provide LRDR Data for Risk Reduction for GMD; Initial Hypersonic Tracking and Reporting; and Cyber Security Enhancements Risk Management Functions. - Utilize the C2BMC Experimentation Laboratory (X-Lab) to plan, coordinate, and provide test operations to demonstrate maturing C2BMC technologies and software builds within an integrated C2BMC environment through flight tests, ground tests, and real-world targets of opportunity before incorporation into formal C2BMC spiral builds. Results from the tests are provided back to the C2BMC and X-Lab development activity. - Participate in wargames and exercises using current and future C2BMC architectures to support all requesting Combatant Commands, NATO partners, and Host Nations allowing warfighters to validate Ballistic Missile Defense (BMD) Techniques, Tactics, and Procedures (TTP) specific to all designated Areas of Operations (AOs) to include current and future C2BMC architectures. - Continue development, sustainment, and upgrades in the C2BMC Testbed (CTB) to support MDA IMTP Events (flight and ground tests). Continue Cyber Testing in the CTB to support continuous C2BMC spiral development. Continue Hardware in the Loop (HWIL) testing, C2BMC, and NATO planning exchanges, demonstrations, and support to NATO live fire events. Maintain Situational Awareness Nodes (Turkey, Romania, and Poland) in accordance with U.S. and Host nation Bi-lateral Agreements. Continue to enhance interoperability between U.S. BMD systems and the NATO BMD systems. Provide infrastructure, network, and troubleshooting support to C2BMC Command Center (CCC), to include the BMDS Network Operations and Security Center (BNOSC), System Test and Operations Center (STOC), C2BMC System Support Center (CSSC), BMDS Communications Network (BCN), the Distributed Training system (DTS), and Combined Overhead Persistent Infrared (OPIR) Laboratories (OCL). Specific and/or unique accomplishments for each FY are as follows: ***FY 2021 Plans:*** - Participate in flight and ground test events to support fielding of Spiral 8.2-5 and BOA 7.0 for Homeland Defense including LRDR by testing the following capabilities: C2BMC generation of initial BMD System Track (discrimination results by enhanced C2BMC selection); LRDR Integration into MDS; Initial GMD use of LRDR data; Initial Active Sensor Bias Monitoring and Reporting			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MT01 / *C2BMC Test*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- In flight test events: Continue to collect data for PIA/SKA algorithm development. Continue to demonstrate AN/TPY-2 FBM ability to execute a cued acquisition tasked by C2BMC based on BOA tracks, and demonstrate C2BMC ability to construct system tracks. - Demonstrate interoperability of C2BMC S8.2-5 with LRDR and conduct GMD simulated engagement using System Track data from C2BMC that includes LRDR discrimination data - In ground test events: Continue to assess C2BMC incremental capability performance, to include support of SKA Hit Assessment fielding in Increment 6B.2; assess ATP alternatives for C2BMC system track typing, correlation, and launch event association processes in the presence of advanced threats. Continue to demonstrate interoperability with Aegis and collect data to assess Aegis Engage-on-Remote (EoR) capability - Continue to assess interoperability of C2BMC S8.2-5, BOA Baseline Release (BBR) 7.0, AN/TPY-2 FBM CX 4.0, LRDR 1.0.0, GS 8 IR6, XBR 4.1, EKV 23.2/10.2, BV 11.0/8.0, SBR 19-1, THAAD 3.2, and THAAD 4.0; assess C2BMC planning, monitoring, and tasking capabilities effect on Homeland Defense performance - Complete consolidation of SBIRS/BOA test lab efforts to plan, coordinate, and provide test operations for MDS system flight tests and ground tests			
FY 2022 Plans: - Participate in flight and ground test events to support fielding of Spiral 8.2-5 and BOA 7.0 for Homeland Defense by testing the following capabilities: Initial MDS Integration with IBCS, Additional Hit Assessment using SKA, Additional Integration of External Mobile Sensor (MSI Phase IIA) - In flight test events: Continue to collect data for SKA algorithm development. Collect data in support of Hypersonic Tracking capability - In ground test events: Continue to assess C2BMC incremental capability performance, to include support of SKA Hit Assessment fielding; assess alternatives for C2BMC system track typing, correlation, and launch event association processes in the presence of advanced threats. Continue to demonstrate interoperability with Aegis and collect data to assess Aegis Engage-on-Remote (EoR) capability - Continue to assess interoperability of C2BMC S8.2-5, BOA Baseline Release (BBR) 7.0, AN/TPY-2 FBM CX 4.0, LRDR 1.0.1, GS 8B, XBR 4.1.1, EKV 23.2/11.0, IBCS 4.6, PDB 8.1, SBR 19-1, and THAAD 4.0; assess C2BMC planning, monitoring, and tasking capabilities effect on Homeland Defense performance - In cyber events: Assess C2BMC and BOA BBR cyber security in Cooperative Vulnerability and Penetration Assessment (CVPA) events in the lab and operational asset environments; and Adversarial Assessment (AA) events in the operational asset environment prior to fielding			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MT01 / *C2BMC Test*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Continue upgrades and implementation of latest DoD required ACAS (Assured Compliance Assessment Solution), ESS (Endpoint Security Services), and Cyber Security increments within the C2BMC Test Bed (CTB) ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides upgrades and implementation of latest DoD required ACAS, ESS, and Cyber Security increments within the CTB as realigned from budget project MC01 to align with the FMR definition of cyber testing, and additional flight/ground test support.			
Accomplishments/Planned Programs Subtotals	63.395	61.264	65.341

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603881C: *Ballistic Missile Defense Terminal Defense Segment*	295.312	312.317	277.949	-	277.949	-	-	-	-	-	-
• 0603882C: *Ballistic Missile Defense Midcourse Defense Segment*	1,275.414	1,219.261	745.144	-	745.144	-	-	-	-	-	-
• 0603884C: *Ballistic Missile Defense Sensors*	348.356	265.803	224.750	-	224.750	-	-	-	-	-	-
• 0603890C: *BMD Enabling Programs*	630.196	616.455	595.301	-	595.301	-	-	-	-	-	-
• 0603892C: *AEGIS BMD*	722.582	877.336	732.512	-	732.512	-	-	-	-	-	-
• 0603904C: *Missile Defense Integration and Operations Center (MDIOC)*	54.783	55.356	52.403	-	52.403	-	-	-	-	-	-
• 0603907C: *Sea Based X-Band Radar (SBX)*	137.604	118.318	147.241	-	147.241	-	-	-	-	-	-
• 0603914C: *Ballistic Missile Defense Test*	398.939	365.208	362.906	-	362.906	-	-	-	-	-	-
• 0603915C: *Ballistic Missile Defense Targets*	545.764	536.133	553.334	-	553.334	-	-	-	-	-	-
• 0604181C: *Hypersonic Defense*	386.528	272.632	247.931	-	247.931	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MT01 / *C2BMC Test*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0604672C: *Homeland Defense Radar-Hawaii*	181.569	133.000	0.000	-	0.000	-	-	-	-	-	-
• 0604673C: *Pacific Discriminating Radar*	2.921	0.000	0.000	-	0.000	-	-	-	-	-	-
• 0604873C: *Long Range Discrimination Radar (LRDR)*	131.135	138.317	133.335	-	133.335	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

A sole source C2BMC contract to Lockheed Martin was awarded 1st quarter FY 2012. The current ordering period is through 1st quarter FY 2025. Major team members to Lockheed are Northrop Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, testing, fielding, training, operations and sustainment, and cyber operations support of the C2BMC system. Additionally, the Defense Information Systems Agency (DISA) supports C2BMC worldwide long-haul communications. C2BMC Program Office government, Federally Funded Research and Development Center/University Affiliated Research Center (FFRDC/UARC), and Contract Support Services (CSS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment. Furthermore, a sole source contract Specialized Warfighter Development Contract (SWDC) was awarded to Northrop Grumman in March 2018 (3 year base and 2 one year option periods) for continuation of the systems engineering, software development, test and integration for BMDS Overhead Persistent Infrared Architecture (BOA).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MT01 / *C2BMC Test*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Master Test Plan - Consolidated Contractor Support	Various	MDA : Huntsville, AL; Colorado Springs, CO; NCR	0.000	0.223	Oct 2019	0.243	Oct 2020	0.247	Oct 2021	-		0.247	Continuing	Continuing	Continuing
Integrated Master Test Plan - Enterprise Sensors Lab Infrastructure Support	MIPR	Various : VA; OH; AL; NM; CA	14.979	2.210	Oct 2019	1.752	Oct 2020	2.099	Oct 2021	-		2.099	Continuing	Continuing	Continuing
Integrated Master Test Plan - Enterprise Sensors Lab Infrastructure/BOA Infrastructure-MDS Level Testing	SS/CPAF	Northrop Grumman Corporation : Colorado Springs, CO	50.369	1.224	Mar 2020	2.480	Mar 2021	2.250	Mar 2022	-		2.250	Continuing	Continuing	Continuing
Integrated Master Test Plan - FFRDC	MIPR	Institute for Defense Analyses (IDA) : Alexandria, VA	0.000	0.350	Oct 2019	1.557	Oct 2020	0.988	Oct 2021	-		0.988	Continuing	Continuing	Continuing
Integrated Master Test Plan - Information Assurance - Test Lab Infrastructure	C/CPAF	Jacobs Technology, Inc : Colorado Springs, CO	0.000	0.000		0.000		5.182	Oct 2021	-		5.182	Continuing	Continuing	Continuing
Integrated Master Test Plan - Integrated Master Test Plan MDS Level Testing	SS/IDIQ	Lockheed Martin Team : Huntsville, AL; Colorado Springs, CO	141.827	20.904	Jul 2020	23.294	Jul 2021	19.484	Jul 2022	-		19.484	Continuing	Continuing	Continuing
Integrated Master Test Plan - Integrated Master Test Plan MDS level Testing - Element/System Test Lab Facilities	C/CPAF	Northrop Grumman Corporation : Colorado Springs, CO	9.029	13.992	Mar 2020	12.847	Mar 2021	14.749	Mar 2022	-		14.749	Continuing	Continuing	Continuing
Integrated Master Test Plan - Integrated Master Test Plan MDS level Testing (Element/System Test Lab Facilities)	C/CPAF	Jacobs Technology, Inc : Huntsville, AL; Colorado Springs, CO	36.595	23.115	Mar 2020	18.309	Mar 2021	19.035	Mar 2022	-		19.035	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MT01 / *C2BMC Test*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Master Test Plan - MDS Level Testing GOV	MIPR	Army/Air Force : Various	10.907	1.377	Oct 2019	0.782	Oct 2020	1.307	Oct 2021	-		1.307	Continuing	Continuing	Continuing
Integrated Master Test Plan - Prior year IMTP no longer funded in the FYDP	Various	Various : Various	90.701	0.000		0.000		0.000		-		0.000	0.000	90.701	0.000
		Subtotal	354.407	63.395		61.264		65.341		-		65.341	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	354.407	63.395		61.264		65.341		-		65.341	Continuing	Continuing	N/A

Remarks

Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MT01 / *C2BMC Test*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
GTI-07c (N/I) (MDS Ground Test)	✦																											
FTX-39 (LTPO, DT Target Only Flight Test)	▲																											
(EX) JUNIPER COBRA 20	✦	✦																										
Enterprise Sensor Lab Infrastructure Support	✦	✦	✦	✦																								
(EX) Joint Live, Virtual, and Constructive 2019/2020	✦	✦	✦	✦	✦																							
GTI-20 Sprint 1(E/C) (MDS Ground Test)		✦																										
FTP-27 E2 (LTPO, DT/OT Flight Test)		▲																										
(EX) EAGLE RESOLVE 20		▲																										
(EX) EUROPEAN AIR & MISSILE DEFENSE EXERCISE 19		▲																										
(EX) RESILIENT SHIELD 20		▲																										
(EX) GLOBAL LIGHTNING 20		✦	✦																									
(EX) GLOBAL RESPONSE EXERCISE 09		✦	✦																									
(EX) JOINT AIR AND MISSILE DEFENSE EXERCISE SERIES 20		✦	✦	✦																								
(EX) AIR AND MISSILE DEFENSE EXERCISE 20		✦	✦	✦																								
GTI-20 Sprint 2 (JEON) (MDS Ground Test)			✦																									
(EX) STEADFAST ALLIANCE 20			✦	✦																								
(WG) Demonstration, Table-top Exercises & Experiments 20			✦	✦	✦																							
FTP-27 E1 (LTPO, DT/OT Flight Test)				▲																								
(EX) EUROPEAN TEST BED 20				✦																								
(EX) GLOBAL RESPONSE EXERCISE 10				▲																								
(EX) KEEN SWORD 21				✦	✦																							
(EX) AUSTERE CHALLENGE 21				✦	✦	✦																						
FTM-44 (AEGIS 5.1, DT Intercept Flight Test)					▲																							
(EX) Joint Project Optic Windmill 2021					✦	✦																						

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MT01 / *C2BMC Test*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
(EX) EUROPEAN AIR & MISSILE DEFENSE EXERCISE 21					✦	✦																						
(EX) AIR AND MISSILE DEFENSE EXERCISE 21					✦	✦	✦																					
(WG) NIMBLE TITAN 22					✧	✧	✧	✧	✧	✧	✧	✧																
Enterprise Sensor Lab Infrastructure Support Planned					✧	✧	✧	✧	✧	✧	✧	✧																
(EX) EUROPEAN AIR & MISSILE DEFENSE EXERCISE 20						▲																						
(EX) RESILIENT SHIELD 21						▲																						
(EX) GLOBAL LIGHTNING 21						✦	✦																					
(EX) EUROPEAN TEST BED 21						✧	✧	✧																				
(EX) JOINT AIR AND MISSILE DEFENSE EXERCISE SERIES 21						✧	✧	✧																				
(EX) Joint Live, Virtual, and Constructive 2021/2022						✧	✧	✧	✧	✧	✧	✧																
FS-21 E1 (AEGIS 5.1, DT Interceptor Only Flight Test)							△																					
FS-21 E2 (AEGIS 5.1, DT Target Only Flight Test)							△																					
FS-21 E3 (AEGIS 5.1, DT Target Only Flight Test)							△																					
FS-21 E4 (AEGIS 5.1, DT Intercept Flight Test)							△																					
(EX) PACIFIC SENTRY 21							✧																					
FTM-31 E1 (AEGIS SBT, DT/OT Intercept Flight Test)							△																					
(WG) Huntsville Wargames 21							✧	✧																				
(WG) Demonstration, Table-top Exercises & Experiments 21							✧	✧	✧																			
FTT-21 (TH, DT Intercept Flight Test)								△																				
FTP-21 E1 (P8.1.1)(LTPO, DT Intercept Flight Test)								△																				
(WG) Space & Missile Defense Symposium 21								△																				
GM BVT-03 (GM, DT Interceptor Only Flight Test)								△																				
(EX) VIGILANT SHIELD 22								✧	✧																			
(EX) GLOBAL THUNDER 21								✧	✧																			

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MT01 / *C2BMC Test*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
(EX) KEEN EDGE 22								✧	✧	✧																		
GTI-ISR (21) (MDS Ground Test)									✧																			
GTI-09 Sprint 1 (E/C) (MDS Ground Test)									✧																			
(EX) JUNIPER COBRA 22									✧	✧																		
(EX) AIR AND MISSILE DEFENSE EXERCISE 22									✧	✧	✧																	
(EX) EAGLE RESOLVE 22										△																		
(EX) RESILIENT SHIELD 22										△																		
GTI-09 Sprint 2 (E/C) (MDS Ground Test)										✧	✧																	
(EX) GLOBAL LIGHTNING 22										✧	✧																	
(EX) STEADFAST ALLIANCE 22										✧	✧																	
(EX) JOINT AIR AND MISSILE DEFENSE EXERCISE SERIES 22										✧	✧	✧																
(EX) EUROPEAN TEST BED 22										✧	✧	✧																
FTX-45											△																	
FTX-42 (OTHER, DT Target Only Flight Test)											△																	
(WG) Demonstration, Table-top Exercises & Experiments 22											✧	✧																
GTD-09 (E/C) (MDS Ground Test)												✧																
(EX) VIGILANT SHIELD 23												✧																
(EX) KEEN SWORD 23												✧																
(EX) GLOBAL RESPONSE EXERCISE 11												✧																
(EX) GLOBAL THUNDER 22												✧																
(EX) GLOBAL RESPONSE EXERCISE 12												✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MT01 / *C2BMC Test*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
GTI-07c (N/I) (MDS Ground Test)	1	2020	1	2020
FTX-39 (LTPO, DT Target Only Flight Test)	1	2020	1	2020
(EX) JUNIPER COBRA 20	1	2020	2	2020
Enterprise Sensor Lab Infrastructure Support	1	2020	4	2020
(EX) Joint Live, Virtual, and Constructive 2019/2020	1	2020	1	2021
GTI-20 Sprint 1(E/C) (MDS Ground Test)	2	2020	2	2020
FTP-27 E2 (LTPO, DT/OT Flight Test)	2	2020	2	2020
(EX) EAGLE RESOLVE 20	2	2020	2	2020
(EX) EUROPEAN AIR & MISSILE DEFENSE EXERCISE 19	2	2020	2	2020
(EX) RESILIENT SHIELD 20	2	2020	2	2020
(EX) GLOBAL LIGHTNING 20	2	2020	3	2020
(EX) GLOBAL RESPONSE EXERCISE 09	2	2020	3	2020
(EX) JOINT AIR AND MISSILE DEFENSE EXERCISE SERIES 20	2	2020	4	2020
(EX) AIR AND MISSILE DEFENSE EXERCISE 20	2	2020	4	2020
GTI-20 Sprint 2 (JEON) (MDS Ground Test)	3	2020	3	2020
(EX) STEADFAST ALLIANCE 20	3	2020	4	2020
(WG) Demonstration, Table-top Exercises & Experiments 20	3	2020	1	2021
FTP-27 E1 (LTPO, DT/OT Flight Test)	4	2020	4	2020
(EX) EUROPEAN TEST BED 20	4	2020	4	2020
(EX) GLOBAL RESPONSE EXERCISE 10	4	2020	4	2020
(EX) KEEN SWORD 21	4	2020	1	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MT01 / *C2BMC Test*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
(EX) AUSTERE CHALLENGE 21	4	2020	2	2021
FTM-44 (AEGIS 5.1, DT Intercept Flight Test)	1	2021	1	2021
(EX) Joint Project Optic Windmill 2021	1	2021	2	2021
(EX) EUROPEAN AIR & MISSILE DEFENSE EXERCISE 21	1	2021	2	2021
(EX) AIR AND MISSILE DEFENSE EXERCISE 21	1	2021	3	2021
(WG) NIMBLE TITAN 22	1	2021	4	2022
Enterprise Sensor Lab Infrastructure Support Planned	1	2021	4	2022
(EX) EUROPEAN AIR & MISSILE DEFENSE EXERCISE 20	2	2021	2	2021
(EX) RESILIENT SHIELD 21	2	2021	2	2021
(EX) GLOBAL LIGHTNING 21	2	2021	3	2021
(EX) EUROPEAN TEST BED 21	2	2021	4	2021
(EX) JOINT AIR AND MISSILE DEFENSE EXERCISE SERIES 21	2	2021	4	2021
(EX) Joint Live, Virtual, and Constructive 2021/2022	2	2021	4	2022
FS-21 E1 (AEGIS 5.1, DT Interceptor Only Flight Test)	3	2021	3	2021
FS-21 E2 (AEGIS 5.1, DT Target Only Flight Test)	3	2021	3	2021
FS-21 E3 (AEGIS 5.1, DT Target Only Flight Test)	3	2021	3	2021
FS-21 E4 (AEGIS 5.1, DT Intercept Flight Test)	3	2021	3	2021
(EX) PACIFIC SENTRY 21	3	2021	3	2021
FTM-31 E1 (AEGIS SBT, DT/OT Intercept Flight Test)	3	2021	3	2021
(WG) Huntsville Wargames 21	3	2021	4	2021
(WG) Demonstration, Table-top Exercises & Experiments 21	3	2021	1	2022
FTT-21 (TH, DT Intercept Flight Test)	4	2021	4	2021
FTP-21 E1 (P8.1.1)(LTPO, DT Intercept Flight Test)	4	2021	4	2021
(WG) Space & Missile Defense Symposium 21	4	2021	4	2021
GM BVT-03 (GM, DT Interceptor Only Flight Test)	4	2021	4	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MT01 / *C2BMC Test*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
(EX) VIGILANT SHIELD 22	4	2021	1	2022
(EX) GLOBAL THUNDER 21	4	2021	1	2022
(EX) KEEN EDGE 22	4	2021	2	2022
GTI-ISR (21) (MDS Ground Test)	1	2022	1	2022
GTI-09 Sprint 1 (E/C) (MDS Ground Test)	1	2022	1	2022
(EX) JUNIPER COBRA 22	1	2022	2	2022
(EX) AIR AND MISSILE DEFENSE EXERCISE 22	1	2022	3	2022
(EX) EAGLE RESOLVE 22	2	2022	2	2022
(EX) RESILIENT SHIELD 22	2	2022	2	2022
GTI-09 Sprint 2 (E/C) (MDS Ground Test)	2	2022	3	2022
(EX) GLOBAL LIGHTNING 22	2	2022	3	2022
(EX) STEADFAST ALLIANCE 22	2	2022	3	2022
(EX) JOINT AIR AND MISSILE DEFENSE EXERCISE SERIES 22	2	2022	4	2022
(EX) EUROPEAN TEST BED 22	2	2022	4	2022
FTX-45	3	2022	3	2022
FTX-42 (OTHER, DT Target Only Flight Test)	3	2022	3	2022
(WG) Demonstration, Table-top Exercises & Experiments 22	3	2022	4	2022
GTD-09 (E/C) (MDS Ground Test)	4	2022	4	2022
(EX) VIGILANT SHIELD 23	4	2022	4	2022
(EX) KEEN SWORD 23	4	2022	4	2022
(EX) GLOBAL RESPONSE EXERCISE 11	4	2022	4	2022
(EX) GLOBAL THUNDER 22	4	2022	4	2022
(EX) GLOBAL RESPONSE EXERCISE 12	4	2022	4	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MT01 / *C2BMC Test*

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	Project (Number/Name) MX01 / *Command & Control, Battle Management, Communications (C2BMC) Development Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MX01: *Command & Control, Battle Management, Communications (C2BMC) Development Support*	727.785	114.017	128.482	125.086	-	125.086	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

C2BMC Development Support provides operations engineering, integrated logistics, warfighter integration, deployment, and disposal of the current operational system and/or systems fielded in USSTRATCOM, USNORTHCOM, USINDOPACOM, USEUCOM, USCENTCOM, and U.S. Space Command (USSPACECOM) and the operation of the C2BMC Control Center. This activity provides continuous support of the development, deployment, sustainment of the C2BMC training systems, and updates training material to stay current with fielded capabilities.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Operations Engineering	91.290	102.606	107.728
Articles:	-	-	-
Description: This activity funds C2BMC support of current operational, test, and training systems. Recurring efforts include: - On-site maintenance, help-desk support, and developer reach-back support to ensure operational availability - C2BMC Command Center (CCC) provides 24 hours a day, 7 days a week, 365 days a year BMDS Overhead Persistent Infra-Red (OPIR) Architecture (BOA) and C2BMC operations including system and network monitoring, system administration, and network defense against cyber-attacks - Integrated logistics support by providing a secure supply chain; reliability, availability, and maintainability (RAM) engineering; obsolescence engineering; and sparing to ensure operational availability - Cybersecurity engineering providing C2BMC Commercial-off-the-shelf (COTS) software/hardware updates and CCC upgrades that address system vulnerabilities, field quarterly updates to reduce system component vulnerability to cyber-attacks - Information System Security Officers (ISSOs) ensuring C2BMC compliance with latest cybersecurity requirements and policies - System modifications driven by Warfighter Involvement Process (WIP), Continuous Improvement Process (CIP), RAM and obsolescence engineering, and external systems such as Space-Based Infrared Sensors (SBIRS), Ground-based Midcourse Defense (GMD) Fire Control (GFC), Aegis, Terminal High Altitude Area Defense (THAAD), Navy Link Monitoring			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MX01 / *Command & Control, Battle Management, Communications (C2BMC) Development Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
and Management Tool (LMMT), AN/TPY-2, standard Army communications, Defense Information Systems Agency (DISA) fiber networks, and Allied/Coalition interfaces - Combatant Command (CCMD) integration providing C2BMC training, on-site Subject Matter Experts (SMEs), and surge SME support for real-world events, flight tests, ground tests, exercises, cyber assessments, and wargames - Facility modifications required to house current or future C2BMC equipment and transportation for moving C2BMC equipment - Integrated product support for tactical satellite communications (SATCOM) used in flight tests, hardened SATCOM, and associated shelters - Provide transportation for flight test equipment and SME support and analysis for numerous test, exercise, and real world events - Provide recurring proficiency training to CCMDs and keep training material and systems consistent with operational capabilities Specific and/or unique accomplishments for each FY are as follow: ***FY 2021 Plans:*** - Provide sustainment of fielded EPAA Phase 3/EOR (Spiral 8.2-3) deployed to USEUCOM, USCENTCOM, USNORTHCOM, and USINDOPACOM - Provide operational planning for LRDR for Homeland Defense (Spiral 8.2-5) - Initiate hardware updates and software licenses to support protection of the system from vulnerability and operational sustainment - Field NORTHCOM user node and second geographically separated management node ***FY 2022 Plans:*** - Transition from providing sustainment of fielded EPAA Phase 3/EOR (Spiral 8.2-3) deployed to USEUCOM, USCENTCOM, USNORTHCOM, and USINDOPACOM to Spiral 8.2-5. - Execute final deployment and integration and testing for LRDR for Homeland Defense (Spiral 8.2-5) - Continue hardware updates and software licenses to support protection of the system from vulnerability and operational sustainment ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides additional material licenses and spares necessary to sustain Spiral 8.2-5 and infrastructure facility modifications to maintain Missile Defense Integration and Operation Center (MDIOC) Facility.			
Title: Concurrent Test, Training, and Operations (CTTO)	22.727	25.876	17.358
Articles:	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MX01 / *Command & Control, Battle Management, Communications (C2BMC) Development Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Description: This element provides the development and sustainment of the C2BMC Training Support System (TSS) and the Missions Specific Vendor Plug-in (MSVP) stand-alone operator training devices and the Distributed Training System (DTS) for USINDOPACOM, USNORTHCOM, USEUCOM, USCENTCOM, and USSPACECOM. C2BMC connects all MDS Elements through virtual and physical networks to facilitate integrated test, training, operations, and certification within two coexistent realms. This enables the warfighter to become proficient on current and future software versions at the operational console, increases the developer's capacity to perform a variety of tests and upgrades on the operational MDS, and decreases recall-to-mission operations times from weeks and days to hours and minutes. The recently acquired C2BMC MSVP is a gaming-based stand-alone trainer developed from a Small Business Innovation Research (SBIR) project. It delivers mission training simulation using core Standard Space Trainer (SST) and provides the same level of training fidelity as the legacy TSS but with greater flexibility in architecture and reduced long term cost. Recurring accomplishments include sustaining current training systems for MDS training events for the Unified Combatant Command developing the next generation training systems, to include the integration of Red Force / Blue Force capability, to keep current with the operational system capabilities. Specific and/or unique accomplishments for each FY are as follows: ***FY 2021 Plans:*** - Continue modifications and verification testing of MDS LRDR for Homeland Defense (Spiral 8.2-5) MSVP and DTS - Continue deployment activities of MDS LRDR for Homeland Defense (Spiral 8.2-5) MSVP and DTS - Continue development/modifications on MDS Radar MSVP and Spiral Training Systems ***FY 2022 Plans:*** - Modifications of MSVP and DTS for inclusion of the capabilities that are planned for delivery in Spiral 8.2-7 - Continue support and deployment activities of MDS LRDR for Homeland Defense (Spiral 8.2-5) for MSVP and DTS - Complete C2BMC Increment 5 (Spiral 8.2-3) training efforts ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects savings from deploying MSVP and the end of development work for C2BMC Increment 5 (Spiral 8.2-3) TSS in FY 2022.			
Accomplishments/Planned Programs Subtotals	114.017	128.482	125.086

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MX01 / *Command & Control, Battle Management, Communications (C2BMC) Development Support*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603881C: *Ballistic Missile Defense Terminal Defense Segment*	295.312	312.317	277.949	-	277.949	-	-	-	-	-	-
• 0603882C: *Ballistic Missile Defense Midcourse Defense Segment*	1,275.414	1,219.261	745.144	-	745.144	-	-	-	-	-	-
• 0603884C: *Ballistic Missile Defense Sensors*	348.356	265.803	224.750	-	224.750	-	-	-	-	-	-
• 0603890C: *BMD Enabling Programs*	630.196	616.455	595.301	-	595.301	-	-	-	-	-	-
• 0603892C: *AEGIS BMD*	722.582	877.336	732.512	-	732.512	-	-	-	-	-	-
• 0603904C: *Missile Defense Integration and Operations Center (MDIOC)*	54.783	55.356	52.403	-	52.403	-	-	-	-	-	-
• 0603907C: *Sea Based X-Band Radar (SBX)*	137.604	118.318	147.241	-	147.241	-	-	-	-	-	-
• 0603914C: *Ballistic Missile Defense Test*	398.939	365.208	362.906	-	362.906	-	-	-	-	-	-
• 0603915C: *Ballistic Missile Defense Targets*	545.764	536.133	553.334	-	553.334	-	-	-	-	-	-
• 0604181C: *Hypersonic Defense*	386.528	272.632	247.931	-	247.931	-	-	-	-	-	-
• 0604672C: *Homeland Defense Radar-Hawaii*	181.569	133.000	0.000	-	0.000	-	-	-	-	-	-
• 0604673C: *Pacific Discriminating Radar*	2.921	0.000	0.000	-	0.000	-	-	-	-	-	-
• 0604873C: *Long Range Discrimination Radar (LRDR)*	131.135	138.317	133.335	-	133.335	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

A sole source C2BMC contract to Lockheed Martin was awarded 1st quarter FY 2012. The current ordering period is through 1st quarter FY 2025. Major team members to Lockheed are Northrop Grumman, Boeing, Raytheon, and General Dynamics. They are charged with the development, testing, fielding, training, operations and

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MX01 / *Command & Control, Battle Management, Communications (C2BMC) Development Support*

sustainment, and cyber operations support of the C2BMC system. Additionally, the Defense Information Systems Agency (DISA) supports C2BMC worldwide long-haul communications. C2BMC Program Office government, Federally Funded Research and Development Center/University Affiliated Research Center (FFRDC/UARC), and Contract Support Services (CSS) personnel are also fully integrated as part of the Prime contractor's team to function in an Integrated Product Team environment. Furthermore, a sole source contract Specialized Warfighter Development Contract (SWDC) was awarded to Northrop Grumman in March 2018 (3 year base and 2 one year option periods) for continuation of the systems engineering, software development, test and integration for BMDS Overhead Persistent Infrared Architecture (BOA). A Small Business Innovation Research (SBIR) Phase III contract with Sonalysts provides a standalone training system which delivers mission training.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MX01 / *Command & Control, Battle Management, Communications (C2BMC) Development Support*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Operations Engineering - Operations Engineering - Contract Support Services (CSS)	MIPR	MDA Various : Huntsville, AL; Colorado Springs, CO; NCR	3.357	0.746	Oct 2019	0.590	Oct 2020	0.609	Oct 2021	-		0.609	Continuing	Continuing	Continuing
Operations Engineering - Operations Engineering - Indirect Support	MIPR	DISA DECC/DISA TECC : Various	48.028	0.000		0.000		0.000		-		0.000	0.000	48.028	0.000
Operations Engineering - Operations Engineering - Specialized Warfighter Development Contract	SS/CPAF	Northrop Grumman Corporation : Huntsville, AL	0.000	0.693	Mar 2020	0.000		0.000		-		0.000	0.000	0.693	0.000
Operations Engineering - Operations Engineering - Sustaining Support	C/CPAF	Jacobs Technology : Huntsville, AL; Colorado Springs, CO	3.103	1.794	Mar 2020	0.000		1.810	Mar 2022	-		1.810	Continuing	Continuing	Continuing
Operations Engineering - Operations Engineering - Training Support	C/FPIF	Boeing : Huntsville, AL	1.336	0.946	Oct 2019	1.171	Oct 2020	1.666	Oct 2021	-		1.666	Continuing	Continuing	Continuing
Operations Engineering - Operations Engineering - Unit Personnel, Control System Improvement Sustaining Support	MIPR	Army, Navy, Air Force : Various	13.505	6.763	Oct 2019	6.601	Oct 2020	12.565	Oct 2021	-		12.565	Continuing	Continuing	Continuing
Operations Engineering - Prior year Operations Engineering no longer funded in the FYDP	Various	Various : Various	9.845	0.000		0.000		0.000		-		0.000	0.000	9.845	9.845
Operations Engineering - Unit Personnel, Control System Improvement, Sustaining Support	SS/CPFF	Lockheed Martin Team : Huntsville, AL	510.098	80.348	Dec 2019	94.244	Dec 2020	91.078	Dec 2021	-		91.078	Continuing	Continuing	Continuing
Concurrent Test, Training, and Operations (CTTO) -	SS/CPFF	Sonalysts : Waterford, CT	0.000	7.049	Nov 2019	2.382	Dec 2020	2.765	Dec 2021	-		2.765	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MX01 / *Command & Control, Battle Management, Communications (C2BMC) Development Support*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
(Training Enhancements) MSVP															
Concurrent Test, Training, and Operations (CTTO) - CTTO/Training Enhancements	MIPR	Aviation and Missile Research Development and Engineering Center : Huntsville, AL	15.236	6.416	Dec 2019	6.429	Dec 2020	8.388	Dec 2021	-		8.388	Continuing	Continuing	Continuing
Concurrent Test, Training, and Operations (CTTO) - Prior year CTTO no longer funded in the FYDP	Various	Various : Various	8.443	0.000		0.000		0.000		-		0.000	0.000	8.443	4.610
Concurrent Test, Training, and Operations (CTTO) - Training Enhancements	SS/CPIF	Lockheed Martin Team : Huntsville, AL; Colorado Springs, CO	114.834	9.262	Dec 2019	17.065	Dec 2020	6.205	Dec 2021	-		6.205	Continuing	Continuing	Continuing
		Subtotal	727.785	114.017		128.482		125.086		-		125.086	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	727.785	114.017		128.482		125.086		-		125.086	Continuing	Continuing	N/A

Remarks

Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MX01 / *Command & Control, Battle Management, Communications (C2BMC) Development Support*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MX01 Command & Control, Battle Management, Communications (C2BMC) Development Support	✦	✦	✦	✦																								
MX01 Command & Control, Battle Management, Communications (C2BMC) Development Support Planned					✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MX01 / *Command & Control, Battle Management, Communications (C2BMC) Development Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MX01 Command & Control, Battle Management, Communications (C2BMC) Development Support	1	2020	4	2020
MX01 Command & Control, Battle Management, Communications (C2BMC) Development Support Planned	1	2021	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	Project (Number/Name) MD40 / *Program-Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program-Wide Support*	145.535	23.682	25.754	22.266	-	22.266	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	23.682	25.754	22.266
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MD40 / *Program-Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the PWS allocation on a pro-rata basis across multiple Agency PE's each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.			
Accomplishments/Planned Programs Subtotals	23.682	25.754	22.266

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Operations Management	Various	Various : Multi: AL, CA, CO, VA	5.919	0.358	Jul 2020	0.000		0.000		-		0.000	6.277	12.554	0.000
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AK, AL, CA, CO, HI, VA	7.924	7.264	Oct 2019	7.899	Jul 2021	4.146	Jul 2022	-		4.146	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services (FFP)	C/FFP	Various : Multi: AK, AL, CA, CO, HI, VA	22.388	0.661	Nov 2019	0.510	Nov 2020	0.586	Nov 2021	-		0.586	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services Civilian Salaries, Travel, Training	Various	Various : Multi: AL, CA, CO, VA	57.268	15.061	Nov 2019	16.765	Oct 2020	16.884	Oct 2021	-		16.884	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations, Sustainment and GPC	Various	Various : Multi: AL, CO, VA etc.	0.000	0.037	Oct 2019	0.050	Nov 2020	0.050	Oct 2021	-		0.050	Continuing	Continuing	Continuing
Program Wide Support - FFRDC/UARC	C/CPAF	JHU/APL : AL, VA	0.000	0.301	Sep 2020	0.530	Dec 2020	0.600	Jan 2022	-		0.600	Continuing	Continuing	Continuing
Program Wide Support - Prior year no longer funded in the FYDP	Various	Various : Various	52.036	0.000		0.000		0.000		-		0.000	0.000	52.036	0.000
		Subtotal	145.535	23.682		25.754		22.266		-		22.266	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	145.535	23.682		25.754		22.266		-		22.266	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603896C / *Ballistic Missile Defense Command and Control, Battle Management & Communication*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency												Date: May 2021
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 0603898C *I Ballistic Missile Defense Joint Warfighter Support*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	264.096	51.095	49.560	50.594	-	50.594	-	-	-	-	-	-
MD03: *Joint Warfighter Support*	119.903	17.242	14.903	18.490	-	18.490	-	-	-	-	-	-
MT03: *Joint Warfighter Support Test*	126.293	31.507	32.531	29.990	-	29.990	-	-	-	-	-	-
MC03: *Cyber Operations*	0.296	0.152	0.157	0.155	-	0.155	-	-	-	-	-	-
MD40: *Program-Wide Support*	17.604	2.194	1.969	1.959	-	1.959	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

N/A

A. Mission Description and Budget Item Justification

The Joint Warfighter Support Program (JWSP) is the Missile Defense Agency's (MDA's) primary means for providing direct technical support to Combatant Commands (CCMDs), the Military Services and the Joint Staff on Missile Defense System (MDS) development, testing, and operational support, to include Real World testing and validation of the warfighter's operational Common Integration Broadcast (CIB). It enables delivery of MDS capabilities to Warfighters and ensures their participation in the identification and development of new Missile Defense (MD) capabilities via the Warfighter Involvement Process (WIP). The JWSP allows the Warfighter and Missile Defense Agency to work together to identify gaps, seams, and needs in warfighting capability and enhance MDS attributes by submitting modification and fielding requests. It also provides 24 hours a day, 7 days a week, 365 days a year MD operational support to Warfighters worldwide, to include global system verification and validation over the operational Common Integrated Broadcast. The program enables rapid response to Warfighter Requests for Information (RFIs) and Requests for Analyses (RFAs), which are especially critical to mission success in protecting U.S. Forces and other defended assets during Real World threat events. The program supports improving products delivered to Warfighters through technical reviews and technical analyses supporting strategic and regional MD planning, development of shot doctrine and MD defense design. The JWSP also enables the inclusion of both CCMD and MDA MD objectives in CCMD/Joint Staff-sponsored exercises and wargames, which are used to sharpen and enhance joint Missile Defense (MD) warfighting skills.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0603898C *I Ballistic Missile Defense Joint Warfighter Support*

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	51.532	49.560	51.735	-	51.735
Current President's Budget	51.095	49.560	50.594	-	50.594
Total Adjustments	-0.437	0.000	-1.141	-	-1.141
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.437	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	0.000	0.000	-1.141	-	-1.141

Change Summary Explanation

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	Project (Number/Name) MD03 / *Joint Warfighter Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD03: *Joint Warfighter Support*	119.903	17.242	14.903	18.490	-	18.490	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The increase from FY 2021 to FY 2022 provides for a realignment of responsibilities for Civilian Liaison Officers and associated Travel and Contract Support from MT03 to MD03 due to an organizational restructuring, as well as the cyclical hardware and software refresh of the Missile Defense Space and Warning Operations Center

A. Mission Description and Budget Item Justification

There are six primary functions in Joint Warfighter Support (MD03):

(1) Current Operations Support
(2) Combatant Command Support
(3) Military Department Engagement
(4) Operational MDS Verification and Validation
(5) Warfighter Training Support
(6) Joint Staff Engagement

Detailed descriptions and accomplishments are provided in section B. Accomplishments/Planned Program

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Strategic Warfighter Integration	17.242	14.903	18.490
Articles:	-	-	-
Description: (1) Current Operations Support: - Manage and operate the MDA Operations Support Center (OSC) 24 hours a day, 7 days a week, 365 days a year and two MDA Operations Centers (MOCs) in Virginia and Alabama for daily execution of scheduled MDS activities; and prepare and transmit Logistic Reports. - Manage and execute the MDS Asset Management (BAM) process of planning, coordinating, scheduling and executing access to operational and Research, Development, Test and Evaluation (RDT&E) assets operated by MDA and Warfighters dispersed globally with differing missions and competing priorities to facilitate assets in support of Warfighter BMD; Missile Warning/Space Surveillance (MW/SS) operations; MDA Research, Development, Test and Evaluation (RDT&E), training and sustainment activities.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MD03 / *Joint Warfighter Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Lead the MDA Operations Support Planning Team (OSPT), an MDA-wide task force supporting Warfighters, Services and the Joint Staff to address real-world contingencies and crisis events. - Develop MDS Annual Plan and MDS Operating Schedule facilitating key stakeholder coordination and maximizing operational availability of the MDS. - Develop and maintain the Integrated Scheduling Tool. - Facilitate major software/hardware additions to the Operational Capacity Baseline for homeland/regional defenses. - Develop and maintain the MDS Operational Readiness Reporting System application to collect and report MDS operational availability and readiness data through the network-based tool to distribute data to OSD, CCMDs, Joint Staff, Military Services, and MDS Operators. - Provide certification training to BMDS watch officers (BWO), BMDS Safety Officers (BSO), and other Operations Support Center staff. (2) Combatant Command Support (United States Strategic Command (USSTRATCOM), United States Northern Command (USNORTHCOM), United States Central Command (USCENTCOM), United States European Command (USEUCOM), United States Indo-Pacific Command (USINDOPACOM), and United States Space Command (USSPACECOM): - Support the Warfighter Involvement Process (WIP) and other MDA Warfighter engagement efforts by assisting Warfighters in their update to the annual MDS Prioritized Capabilities List (PCL) and Modification and Fielding Request List (MFRL). - Aid CCMD participation in missile defense capability definition, design, development, integration, and delivery processes through the WIP to synchronize capability delivery with operational readiness and acceptance. - Support Joint Functional Component Command Integrated Missile Defense (JFCC IMD) integration by participating in the Warfighter Forum (WFF) a multi-lateral information and decision event to address CCMD, Service and Department of Defense (DoD) MDS equities. - Assist USNORTHCOM in broadening homeland defense planning to address the full range of USNORTHCOM threats by conducting the Homeland Defense Architecture Working Group (HDAWG) and Shot Management Analysis Cell (SMAC). - Prepare MDA senior leadership for engagements with CCMDs. - Interface with CCMDs on MD operational issues by providing planning and analysis support and translating warfighter responses to MDA issues. - Manage the Warfighter Requests for Information (RFIs); Requests for Analyses (RFAs); and Requests for Allied Participation in Tests (RFT) processes. (3) Military Department Engagement:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MD03 / *Joint Warfighter Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Facilitate and coordinate Service Boards of Directors (BODs) on Lead Service MDS related equities, Program Objective Memorandum (POM) development and execution; element fielding, operations and maintenance, and the MDS capability delivery process. - Maintain daily, strategic-level interfaces with Military Services and Joint Staff plan for the delivery, fielding, and operation of respective Lead Service MDS capabilities via senior-level working groups, General Officer Air and Missile Defense and Space forums. - Support transition and transfer to the Military Services through participation in senior-level working groups, Joint Staff directorates, and facilitate General Officer forums. (4) Operational MDS Verification and Validation: - Provide 24 hours a day, 7 days a week, 365 days a year, global system verification and validation over the operational Common Integrated Broadcast, and Shared Early Warning System for MD early warning data. - Support Tactical Data Processor software development, MDA flight tests and other software development efforts using live real-world broadcasts of simulated missile threats. - Support Naval Board of Inspection and Survey (INSURV), Shipboard installation, Aegis On-Demand, Aegis program releases, US and Coalition operational readiness and BMD Exercise requirements to validate equipment, materiel, and tactical readiness while simultaneously providing deployment certification and crew operator qualification - Verify operational readiness of both US and Coalition partners to detect a real-world launch of a ballistic threat. (5) Warfighter Training Support: - Provide Missile Defense Space Warning tool (MDST) support to increase operator proficiency, competence, and confidence; provide initial qualification training; and ship certification for Aegis BMD crews. - Provide technical and programmatic updates for BMD Warfighter training; participates in MDS training and Education Working Group to coordinate MDS training issues with USSPACECOM and Joint Staff. - Support Fleet Synthetic and Aegis Operator Training to ensure operational readiness of Aegis as the first step in the kill chain for MD. - Provide Early Warning missile injects for MT03 war games and exercises and tailored support for other Joint Warfighter Support Test events (as listed in the IMTP and R-4/4A schedule). (6) Joint Staff Engagement: - Facilitate and coordinate all Joint Staff interactions with the MDA. - Maintain daily, strategic-level interfaces with the Joint Staff.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MD03 / *Joint Warfighter Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Specific and/or unique accomplishments for each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE ***FY 2022 Plans:*** - SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The increase from FY 2021 to FY 2022 provides for a realignment of responsibilities for Civilian Liaison Officers and associated Travel and Contract Support from MT03 to MD03 due to an organizational restructuring, as well as the cyclical hardware and software refresh of the Missile Defense Space and Warning Operations Center			
Accomplishments/Planned Programs Subtotals	17.242	14.903	18.490

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603882C: *Ballistic Missile Defense Midcourse Defense Segment*	1,275.414	1,219.261	745.144	-	745.144	-	-	-	-	-	-
• 0603884C: *Ballistic Missile Defense Sensors*	348.356	265.803	224.750	-	224.750	-	-	-	-	-	-
• 0603890C: *BMD Enabling Programs*	630.196	616.455	595.301	-	595.301	-	-	-	-	-	-
• 0603892C: *AEGIS BMD*	722.582	877.336	732.512	-	732.512	-	-	-	-	-	-
• 0603896C: *Ballistic Missile Defense Command and Control, Battle Management & Communication*	550.513	645.741	603.448	-	603.448	-	-	-	-	-	-
• 0603904C: *Missile Defense Integration and Operations Center (MDIOC)*	54.783	55.356	52.403	-	52.403	-	-	-	-	-	-

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MD03 / *Joint Warfighter Support*

D. Acquisition Strategy

The Integrated Research and Development for Enterprise Solutions (IRES) Contract and the Specialized Warfighter Development Contract are the major performing integrated contracts. The acquisition strategy for Strategic Warfighter Integration mission execution is to employ a contract to perform designated integration and sustainment tasks to conduct MDS Research, Development, Test and Evaluation (RDT&E). Strategic Warfighter Integration is operated by missile defense subject matter experts composed of Government, military, civilian personnel, Contract Support Services, and major defense contractors.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MD03 / *Joint Warfighter Support*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Strategic Warfighter Integration - Strategic Warfighter Integration - HR A&AS	C/CPFF	LSINC Corp : Colorado Springs	0.676	0.145	Dec 2019	0.148	Dec 2020	0.000		-		0.000	0.000	0.969	0.000
Strategic Warfighter Integration - Strategic Warfighter Integration - Administrative A&AS	C/CPFF	Yorktown : Colorado Springs	1.712	0.260	Nov 2019	0.265	Dec 2020	0.000		-		0.000	0.000	2.237	0.000
Strategic Warfighter Integration - Strategic Warfighter Integration - Civilian Salaries/ Operations Sustainment	Allot	MDA : Colorado Springs/Huntsville, NCR	38.333	4.276	Oct 2019	3.646	Oct 2020	5.190	Oct 2021	-		5.190	Continuing	Continuing	Continuing
Strategic Warfighter Integration - Strategic Warfighter Integration - Current Operations	C/CPAF	Jacobs Technology/ IRES : Colorado Springs	23.163	3.458	Nov 2019	1.510	Nov 2020	1.322	Dec 2021	-		1.322	Continuing	Continuing	Continuing
Strategic Warfighter Integration - Strategic Warfighter Integration - IT Wireless Services (JRDC/ IRES)	C/CPAF	Jacobs Technology/ IRES : Colorado Springs, Huntsville	4.325	0.546	Dec 2019	0.557	Jan 2021	1.750	Jan 2022	-		1.750	Continuing	Continuing	Continuing
Strategic Warfighter Integration - Strategic Warfighter Integration - MDST	C/CPAF	Northrop Grumman/ SWDC : Colorado Springs	23.038	3.719	Nov 2019	3.794	Nov 2020	4.337	Nov 2021	-		4.337	Continuing	Continuing	Continuing
Strategic Warfighter Integration - Strategic Warfighter Integration - Travel and Training	Allot	MDA : Colorado Springs, Huntsville, NCR	1.597	0.238	Oct 2019	0.245	Oct 2020	0.119	Oct 2021	-		0.119	Continuing	Continuing	Continuing
Strategic Warfighter Integration - Strategic Warfighter Integration - Warfighter Support A&AS	C/CPFF	Parsons : Colorado Springs, Huntsville, NCR	27.059	4.600	Nov 2019	4.738	Nov 2020	5.772	Nov 2021	-		5.772	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MD03 / *Joint Warfighter Support*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Strategic Warfighter Integration - Test, Exercises and Wargames - A&AS	C/CPFF	Millennium Eng & Int. : Colorado Springs/Huntsville	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	0.000
		Subtotal	119.903	17.242		14.903		18.490		-		18.490	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	119.903	17.242		14.903		18.490		-		18.490	Continuing	Continuing	N/A

Remarks

Funding in the All Prior Years column represents a summary of Prior Years Total Costs for active contracts, Military Interdepartmental Purchase Requests, and civilian salaries on the R-3.

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MD03 / *Joint Warfighter Support*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
Strategic Integration Wargame Events in support of MT03	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MD03 / *Joint Warfighter Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Strategic Integration Wargame Events in support of MT03	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	Project (Number/Name) MT03 / *Joint Warfighter Support Test*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MT03: *Joint Warfighter Support Test*	126.293	31.507	32.531	29.990	-	29.990	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

Joint Warfighter Support Test is to provide support to MDS Exercises and Wargames.

Exercises and Wargames:
- Support the Warfighter to plan and conduct worldwide exercises and wargames supporting MDS development and fielding.
- Enable the Warfighter to define, test, deploy, and employ new missile defense capabilities.
- Support Joint Functional Component Commander for Integrated Missile Defense (JFCC IMD) MDS Table Top Exercises (TTX) to facilitate the global missile defense capability and to refine the European capability concept of operations through low-fidelity demonstration Models & Simulation (M&S).
- Continuing test planning for Exercises and Wargames.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Wargames and Exercises	25.679	26.864	26.755
Articles:	-	-	-
Description: The Missile Defense Agency provides operational-level interfaces to the Global Combatant Commands (GCCs) and ensures Warfighter participation to develop future missile defense capabilities. The MDA will continue to enhance Warfighter operational support through internal support activities and proactive execution of Combatant Command (CCMD) interface activities. - Work with CCMDs on the inclusion of Allies and regional partners into MDA Ground and Flight tests and exercises and wargames simulations. - Provide Warfighter training simulations in direct support of flight and ground tests. - Serve as liaison between internal MDA organizations and the JFCC IMD across all functional areas to facilitate GCC participation in the MDS capability definition, design, development, integration and delivery processes. - Support JFCC IMD and USEUCOM in the European Phased Adaptive Approach (EPAA) implementation process through the planning, testing, integration and execution of MDS exercises and wargames. - Support Joint Staff integration of MDA models into Tier I events through the Joint, Live Virtual Constructive (JLVC) campaign.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MT03 / *Joint Warfighter Support Test*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Work with Program Offices and the Warfighter; publish a Concept of Operations that will support future MDA Models and Simulation (M&S) support to MDS exercises and wargames. - Coordinate and integrate CCMD requirements into the MDS Integrated Master Test Plan. - Provide support to the development and update of Ballistic Missile Defense (BMD) portions of CCMD Operation Plans (OPLANS) and Contingency Plans (CONPLANS). - Engage in MDA/GCC interface and synchronization of information regarding capabilities and security cooperation strategies. - Develop and provide exercises, wargames and Table Top Exercises (TTX) in support of CCMD-specific scenarios as listed in the R4-4A schedule for the USEUCOM, USINDOPACOM, USCENTCOM and USNORTHCOM/USSTRATCOM Geographic Combatant Commands. Additional GCC interface activities by region will include: USEUCOM Engagement: - Coordinate with USEUCOM for continued MDA support of key EPAA Approach milestones in order to provide a full range of MDS capabilities addressing ballistic missile threats to the European theater. - Work with USEUCOM to include NATO Allies and regional partners during MDA Ground tests, Flight tests, exercises and wargames in order to improve Allied - US MDS interoperability. - Coordinate with MDA program elements to facilitate rapid agency responses to USEUCOM requests for analysis and information. Provide reach-back support for the MDA ATD and LNO in USEUCOM for activities requiring visibility by the MDA Director and Director for Test. - Coordinate with MDA Global Deployment Program Office to plan and execute actions required for deployment of MDS assets in the USEUCOM theater of operations. USCENTCOM Engagement: - Promote CCMD leadership in developing a regional partner data sharing system supporting USCENTCOM regional IAMD architecture development. - Coordinate with MDA program elements, assisting in planning and execution activities supporting USCENTCOM's regional partners. USINDOPACOM Engagement: - Assist USINDOPACOM leadership in broadening Phased Adaptive Approach planning to address a full range of threats and integration of allies into the MDS. - Support USINDOPACOM J3 in efforts to promote the Aegis Ashore system.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MT03 / *Joint Warfighter Support Test*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Share operational information and knowledge and help allies develop common operational procedures. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Program, Planning and Operations	5.828	5.667	3.235
Articles:	-	-	-
Description: MDA provides and ensures Warfighter participation in the development of future missile defense capabilities and requirements. The key Warfighter interface activities include: - Provide resource management and administration of MT03 personnel and funding. - Manage and provide programmatic direction and oversight of the MDA Wargames and Exercise program. - Provide MDA Wargames and Exercises support to the Office of the Secretary of Defense (OSD), Military Service Components, the Joint Chiefs of Staff, the CCMD, the JFCC IMD, and international partners/allies to assist warfighter Tactics, Techniques, and Procedures (TTPs) validation and identify gaps that drive warfighter requirements. - Lead MDA planning, testing, integration and execution of all MDA-supported CCMD Wargames and Exercises ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** - Decrease from FY 2021 to FY 2022 reflects a movement in requirements from MT03 to MD03 within PE 0603898C per MDA organizational changes			
Accomplishments/Planned Programs Subtotals	31.507	32.531	29.990

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MT03 / *Joint Warfighter Support Test*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

In order to optimize the performance of the Missile Defense System, MDA leverages Defense Department executive agents as well as the MDA Integrated Research and Development for Enterprise Solutions (IRES) contract.

The executing agents utilize various contracting strategies in a flexible manner to maximize their contribution to the MDS. Products and Services are acquired by competitive means to the extent that is possible and practical.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MT03 / *Joint Warfighter Support Test*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Wargames and Exercises - Wargames and Exercises	C/CPAF	SWDC : Colorado Springs	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	0.000
Wargames and Exercises - Wargames and Exercises - Combatant Commanders (COCOM)/Wargame Support	C/CPIF	IRES/MIPR : Jacobs / CO/TX/NH	74.423	25.679	Nov 2019	26.864	Nov 2020	22.806	Nov 2021	-		22.806	Continuing	Continuing	Continuing
Wargames and Exercises - Wargames and Exercises - Wargame Support	MIPR	SIM Center, SMDC/ LTPO, SPAWAR : CO/AL/TX/CA	27.743	0.000		0.000		3.949	Nov 2021	-		3.949	Continuing	Continuing	Continuing
Program, Planning and Operations - Civilian Salaries	Allot	MDA : Various	0.000	0.000		2.190	Nov 2020	1.396	Nov 2021	-		1.396	Continuing	Continuing	Continuing
Program, Planning and Operations - Combatant Commanders (COCOM) Support A&AS	C/CPFF	TEAMS : Colorado Springs, Huntsville	4.256	2.198	Oct 2019	2.437	Oct 2020	1.187	Nov 2021	-		1.187	Continuing	Continuing	Continuing
Program, Planning and Operations - Government Travel & Training	Allot	MDA : Colorado Springs, Huntsville, NCR	2.788	0.000		0.000		0.000		-		0.000	0.000	2.788	0.000
Program, Planning and Operations - Operations Sustainment/Travel & Training	C/CPFF	MDA : Colorado Springs, Huntsville	8.408	3.630	Oct 2019	1.040	Oct 2020	0.652	Nov 2021	-		0.652	Continuing	Continuing	Continuing
Program, Planning and Operations - Support to MDA Leadership A&AS	C/CPFF	TEAMS : Colorado Springs, Huntsville, NCR	8.675	0.000		0.000		0.000		-		0.000	0.000	8.675	0.000
		Subtotal	126.293	31.507		32.531		29.990		-		29.990	Continuing	Continuing	N/A

Remarks

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	Project (Number/Name) MT03 / *Joint Warfighter Support Test*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	126.293	31.507		32.531		29.990		-		29.990	Continuing	Continuing	N/A

Remarks

Prior year funding was captured in the MD03 budget project.
Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MT03 / *Joint Warfighter Support Test*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
(EX) AUSTERE CHALLENGE 19	✦																											
(WG) Demonstration, Table-top Exercises & Experiments 19	✦																											
(EX) VIGILANT SHIELD 20	✦																											
(EX) KEEN EDGE 20	✦	✦																										
(EX) GLOBAL THUNDER 20	✦	✦	✦	✦																								
(EX) JUNIPER COBRA 20	✦	✦																										
(WG) NIMBLE TITAN 20	✦	✦	✦	✦																								
(EX) EAGLE RESOLVE 20		▲																										
(EX) EUROPEAN AIR & MISSILE DEFENSE EXERCISE 19		▲																										
(EX) RESILIENT SHIELD 20		▲																										
(EX) COMBINED COMMAND POST TRAINING 20-1		▲																										
(EX) PACIFIC SENTRY 20-2		▲																										
(EX) GLOBAL LIGHTNING 20		✦	✦																									
(EX) GLOBAL RESPONSE EXERCISE 09		✦	✦																									
(EX) AIR AND MISSILE DEFENSE EXERCISE 20		✦	✦	✦																								
(EX) JOINT AIR AND MISSILE DEFENSE EXERCISE SERIES 20		✦	✦	✦																								
(EX) ASTRAL KNIGHT 20			▲																									
(EX) STEADFAST ALLIANCE 20			✦	✦																								
(EX) COMBINED COMMAND POST TRAINING 20-2				▲																								
(EX) EUROPEAN TEST BED 20				✦																								
(EX) GLOBAL RESPONSE EXERCISE 10				▲																								
(EX) KEEN SWORD 21				✦	✦																							
(EX) AUSTERE CHALLENGE 21				✦	✦	✦																						
(EX) Joint Project Optic Windmill 2021					✦	✦																						

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MT03 / *Joint Warfighter Support Test*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
(EX) AIR AND MISSILE DEFENSE EXERCISE 21					✦	✦	✦																					
(EX) RESILIENT SHIELD 21						▲																						
(EX) GLOBAL LIGHTNING 21						✦	✦																					
(WG) Demonstration, Table-top Exercises & Experiments 20			✦	✦	✦																							
(EX) Joint Live, Virtual, and Constructive 2019/2020	✦	✦	✦	✦	✦																							
(EX) EUROPEAN AIR & MISSILE DEFENSE EXERCISE 21					✦	✦																						
(EX) COMBINED FLYING TRAINING EVENT (CFTE) 21					▲																							
(EX) COMBINED FLYING TRAINING EVENT (CFTE) 23					▲																							
(EX) COMBINED FLYING TRAINING EVENT (CFTE) 24					▲																							
(EX) COMBINED FLYING TRAINING EVENT (CFTE) 25					▲																							
(EX) COMBINED FLYING TRAINING EVENT (CFTE) 26					▲																							
(EX) EUROPEAN AIR & MISSILE DEFENSE EXERCISE 20						▲																						
(EX) PACIFIC FURY 21						▲																						
(WG) NIMBLE TITAN 22					✧	✧	✧	✧	✧	✧	✧	✧																
(EX) EUROPEAN TEST BED 21						✧	✧	✧																				
(EX) STEADFAST ARMOUR 21						✧	✧																					
(EX) JOINT AIR AND MISSILE DEFENSE EXERCISE SERIES 21						✧	✧	✧																				
(EX) Joint Live, Virtual, and Constructive 2021/2022						✧	✧	✧	✧	✧	✧	✧																
(WG) Missile Defense Wargame 22						✧	✧	✧	✧	✧	✧																	
(EX) PACIFIC SENTRY 21							✧																					
(WG) Huntsville Wargames 21							✧	✧																				
(EX) ASTRAL KNIGHT 21							△																					
(WG) Demonstration, Table-top Exercises & Experiments 21							✧	✧	✧																			
(WG) Space & Missile Defense Symposium 21								△																				

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MT03 / *Joint Warfighter Support Test*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
(EX) COMBINED COMMAND POST TRAINING 21-2								△																				
(EX) VIGILANT SHIELD 22								✧	✧																			
(EX) KEEN EDGE 22								✧	✧	✧																		
(EX) GLOBAL THUNDER 21								✧	✧																			
(EX) JUNIPER COBRA 22									✧	✧																		
(EX) COMBINED FLYING TRAINING EVENT (CFTE) 22									△																			
(EX) AIR AND MISSILE DEFENSE EXERCISE 22									✧	✧	✧																	
(EX) GLOBAL LIGHTNING 22										✧	✧																	
(EX) EAGLE RESOLVE 22										△																		
(EX) COMBINED COMMAND POST TRAINING 22-1										△																		
(EX) EUROPEAN TEST BED 22										✧	✧	✧																
(EX) RESILIENT SHIELD 22										△																		
(EX) PACIFIC FURY 22										△																		
(EX) STEADFAST ALLIANCE 22										✧	✧																	
(EX) JOINT AIR AND MISSILE DEFENSE EXERCISE SERIES 22										✧	✧	✧																
(EX) ASTRAL KNIGHT 22											△																	
(WG) Demonstration, Table-top Exercises & Experiments 22											✧	✧																
(EX) VIGILANT SHIELD 23												✧																
(EX) KEEN SWORD 23												✧																
(EX) COMBINED COMMAND POST TRAINING 22-2												△																
(EX) GLOBAL THUNDER 22												✧																
(EX) GLOBAL RESPONSE EXERCISE 11												✧																
(EX) PACIFIC SENTRY 22												△																
(EX) GLOBAL RESPONSE EXERCISE 12												✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MT03 / *Joint Warfighter Support Test*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
(EX) AUSTERE CHALLENGE 19	1	2020	1	2020
(WG) Demonstration, Table-top Exercises & Experiments 19	1	2020	1	2020
(EX) VIGILANT SHIELD 20	1	2020	1	2020
(EX) KEEN EDGE 20	1	2020	2	2020
(EX) GLOBAL THUNDER 20	1	2020	4	2020
(EX) JUNIPER COBRA 20	1	2020	2	2020
(WG) NIMBLE TITAN 20	1	2020	4	2020
(EX) EAGLE RESOLVE 20	2	2020	2	2020
(EX) EUROPEAN AIR & MISSILE DEFENSE EXERCISE 19	2	2020	2	2020
(EX) RESILIENT SHIELD 20	2	2020	2	2020
(EX) COMBINED COMMAND POST TRAINING 20-1	2	2020	2	2020
(EX) PACIFIC SENTRY 20-2	2	2020	2	2020
(EX) GLOBAL LIGHTNING 20	2	2020	3	2020
(EX) GLOBAL RESPONSE EXERCISE 09	2	2020	3	2020
(EX) AIR AND MISSILE DEFENSE EXERCISE 20	2	2020	4	2020
(EX) JOINT AIR AND MISSILE DEFENSE EXERCISE SERIES 20	2	2020	4	2020
(EX) ASTRAL KNIGHT 20	3	2020	3	2020
(EX) STEADFAST ALLIANCE 20	3	2020	4	2020
(EX) COMBINED COMMAND POST TRAINING 20-2	4	2020	4	2020
(EX) EUROPEAN TEST BED 20	4	2020	4	2020
(EX) GLOBAL RESPONSE EXERCISE 10	4	2020	4	2020
(EX) KEEN SWORD 21	4	2020	1	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MT03 / *Joint Warfighter Support Test*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
(EX) AUSTERE CHALLENGE 21	4	2020	2	2021
(EX) Joint Project Optic Windmill 2021	1	2021	2	2021
(EX) AIR AND MISSILE DEFENSE EXERCISE 21	1	2021	3	2021
(EX) RESILIENT SHIELD 21	2	2021	2	2021
(EX) GLOBAL LIGHTNING 21	2	2021	3	2021
(WG) Demonstration, Table-top Exercises & Experiments 20	3	2020	1	2021
(EX) Joint Live, Virtual, and Constructive 2019/2020	1	2020	1	2021
(EX) EUROPEAN AIR & MISSILE DEFENSE EXERCISE 21	1	2021	2	2021
(EX) COMBINED FLYING TRAINING EVENT (CFTE) 21	1	2021	1	2021
(EX) COMBINED FLYING TRAINING EVENT (CFTE) 23	1	2021	1	2021
(EX) COMBINED FLYING TRAINING EVENT (CFTE) 24	1	2021	1	2021
(EX) COMBINED FLYING TRAINING EVENT (CFTE) 25	1	2021	1	2021
(EX) COMBINED FLYING TRAINING EVENT (CFTE) 26	1	2021	1	2021
(EX) EUROPEAN AIR & MISSILE DEFENSE EXERCISE 20	2	2021	2	2021
(EX) PACIFIC FURY 21	2	2021	2	2021
(WG) NIMBLE TITAN 22	1	2021	4	2022
(EX) EUROPEAN TEST BED 21	2	2021	4	2021
(EX) STEADFAST ARMOUR 21	2	2021	3	2021
(EX) JOINT AIR AND MISSILE DEFENSE EXERCISE SERIES 21	2	2021	4	2021
(EX) Joint Live, Virtual, and Constructive 2021/2022	2	2021	4	2022
(WG) Missile Defense Wargame 22	2	2021	3	2022
(EX) PACIFIC SENTRY 21	3	2021	3	2021
(WG) Huntsville Wargames 21	3	2021	4	2021
(EX) ASTRAL KNIGHT 21	3	2021	3	2021
(WG) Demonstration, Table-top Exercises & Experiments 21	3	2021	1	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MT03 / *Joint Warfighter Support Test*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
(WG) Space & Missile Defense Symposium 21	4	2021	4	2021
(EX) COMBINED COMMAND POST TRAINING 21-2	4	2021	4	2021
(EX) VIGILANT SHIELD 22	4	2021	1	2022
(EX) KEEN EDGE 22	4	2021	2	2022
(EX) GLOBAL THUNDER 21	4	2021	1	2022
(EX) JUNIPER COBRA 22	1	2022	2	2022
(EX) COMBINED FLYING TRAINING EVENT (CFTE) 22	1	2022	1	2022
(EX) AIR AND MISSILE DEFENSE EXERCISE 22	1	2022	3	2022
(EX) GLOBAL LIGHTNING 22	2	2022	3	2022
(EX) EAGLE RESOLVE 22	2	2022	2	2022
(EX) COMBINED COMMAND POST TRAINING 22-1	2	2022	2	2022
(EX) EUROPEAN TEST BED 22	2	2022	4	2022
(EX) RESILIENT SHIELD 22	2	2022	2	2022
(EX) PACIFIC FURY 22	2	2022	2	2022
(EX) STEADFAST ALLIANCE 22	2	2022	3	2022
(EX) JOINT AIR AND MISSILE DEFENSE EXERCISE SERIES 22	2	2022	4	2022
(EX) ASTRAL KNIGHT 22	3	2022	3	2022
(WG) Demonstration, Table-top Exercises & Experiments 22	3	2022	4	2022
(EX) VIGILANT SHIELD 23	4	2022	4	2022
(EX) KEEN SWORD 23	4	2022	4	2022
(EX) COMBINED COMMAND POST TRAINING 22-2	4	2022	4	2022
(EX) GLOBAL THUNDER 22	4	2022	4	2022
(EX) GLOBAL RESPONSE EXERCISE 11	4	2022	4	2022
(EX) PACIFIC SENTRY 22	4	2022	4	2022
(EX) GLOBAL RESPONSE EXERCISE 12	4	2022	4	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MT03 / *Joint Warfighter Support Test*

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	Project (Number/Name) MC03 / *Cyber Operations*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MC03: *Cyber Operations*	0.296	0.152	0.157	0.155	-	0.155	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

This project verifies and validates that cybersecurity and/or cybersecurity-enabled products (firewalls, data/network encryption devices, routers, Intrusion Detection Systems, etc.) used within the MDA infrastructure have a current and Evaluated Assurance Level (EAL) certification and rating. They assure that validated IT products are listed on the DOD Approved Products List Integrated Tracking System (APLITS). There is an additional requirement to routinely identify findings and prepare a report with recommendations. This support is required in the IT product evaluation. Activities in the Project are necessary to comply with the Federal Information Systems Modernization Act of 2014 (FISMA).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Strategic Warfighter Integration Software Assurance Support	0.152	0.157	0.155
Articles:	-	-	-
Description: Perform manual and automated software code analysis, using GFE tools (e.g. Fortify 360), to detect false positives, weaknesses, and vulnerabilities. 1) Verify and validate cybersecurity and/or cybersecurity-enabled products (firewalls, data/network encryptors, routers, Intrusion Detection Systems, etc.) used within the MDA infrastructure have a current and Evaluated Assurance Level (EAL) certification and rating. Validate IT products are listed on the DoD APLITS. 2) Participate in meetings with customers to review software analysis findings and proposed courses of action for remediation. 3) Prepare a comprehensive report detailing the weaknesses and vulnerabilities found. Document the references to files and line numbers. 4) Maintain a record of all software code analysis documentation and organized in accordance with Government policy. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE ***FY 2022 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MC03 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	0.152	0.157	0.155

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MC03 / *Cyber Operations*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Strategic Warfighter Integration Software Assurance Support - DW Cyber Support (ICVA)	C/CPFF	Decisive Analytics Corp. : COS	0.296	0.152	Dec 2019	0.157	Feb 2021	0.155	Jan 2022	-		0.155	Continuing	Continuing	Continuing
		Subtotal	0.296	0.152		0.157		0.155		-		0.155	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.296	0.152		0.157		0.155		-		0.155	Continuing	Continuing	N/A

Remarks

Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MC03 / *Cyber Operations*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MC03 Cyber Operations	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MC03 / *Cyber Operations*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MC03 Cyber Operations	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	Project (Number/Name) MD40 / *Program-Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program-Wide Support*	17.604	2.194	1.969	1.959	-	1.959	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	2.194	1.969	1.959
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment,			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MD40 / *Program-Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	2.194	1.969	1.959

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Operations Management	Various	Various Multi: AL, CO, CA, VA : Various	0.905	0.033	Jul 2020	0.060	Jul 2021	0.073	Jul 2022	-		0.073	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Civilian Salaries, Travel, Training	Various	MDA : Multi: AK,AL, CA, CO, VA	6.430	1.200	Jan 2020	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	ALATEC, INC, : AL, CO, VA	7.316	0.961	May 2020	1.909	Jul 2021	1.886	May 2022	-		1.886	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services (Reqn)	Reqn	Various : Multi: AK, AL, CA, CO, VA	1.496	0.000		0.000		0.000		-		0.000	0.000	1.496	0.000
Program Wide Support - Prior year no longer funded in the FYDP	Various	Various: : Various	1.457	0.000		0.000		0.000		-		0.000	0.000	1.457	0.000
		Subtotal	17.604	2.194		1.969		1.959		-		1.959	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	17.604	2.194		1.969		1.959		-		1.959	Continuing	Continuing	N/A

Remarks

Award Dates reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603898C / *Ballistic Missile Defense Joint Warfighter Support*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 0603904C *I Missile Defense Integration and Operations Center (MDIOC)*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	524.393	54.783	55.356	52.403	-	52.403	-	-	-	-	-	-
MD22: *Missile Defense Integration and Operations Center (MDIOC)*	496.338	51.633	52.519	49.740	-	49.740	-	-	-	-	-	-
MC22: *Cyber Operations*	3.211	0.618	0.638	0.638	-	0.638	-	-	-	-	-	-
MD40: *Program-Wide Support*	24.844	2.532	2.199	2.025	-	2.025	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

N/A

A. Mission Description and Budget Item Justification

The Missile Defense Integration and Operations Center (MDIOC) is the Missile Defense Agency's (MDA) field operating activity in Colorado Springs, Colorado. The MDIOC provides necessary infrastructure and support services through a mission execution platform for MDA elements/components and designated Combatant Commanders' Missile Defense System (MDS) operations executing missions at the MDIOC. The Integration Center is the organization responsible for providing a single, integrated set of skilled personnel matrixed from across MDA to manage this mission. The MDIOC mission facilities consist of a highly secure research and development complex and a consolidated support facility located at Schriever Air Force Base, just east of North American Aerospace Defense Command (NORAD) and United States Northern Command (USNORTHCOM). The MDIOC provides mission critical system technical capabilities and subject matter expertise in a dedicated and adaptable environment that enables developers, testers, and operators to evolve, assess and deliver the capabilities for layered missile defense execution for homeland defense and theater/regional support. The MDIOC interfaces with the Information Technology and Information Assurance Enterprise to provide high availability access to worldwide secure communications, network health and status monitoring, mission critical restoral capability, and technical expertise for all MDA directed activities and events. The MDIOC functions as the mission control for MDS distributed ground tests and system wide flight tests enabling the mission and test directors to control both main and associated test operations using secure voice, test, and mission network hubs from the MDIOC. The MDIOC also functions as the only system-level integration and interoperability mission execution platform for MDS fire control; and it provides the physical interface between the developers and the Combatant Command (CCMD) warfighters.

MDIOC mission facilities contribute to the MDS by directly supporting the concept of Concurrent Test, Training, and Operations (CTTO) for the MDS by providing mission assurance, engineering integration, resource scheduling, configuration management, and implementation development support for MDA and MDS-level test, training, and operational mission execution.

MDIOC Major Program Goals:
- Provide the capabilities and services necessary to support mission assurance, engineering integration, resource scheduling for ground and flight tests, configuration

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0603904C *I Missile Defense Integration and Operations Center (MDIOC)*

management, and implementation development support of on-site activities
- Ensure around the clock support and restoral of designated MDS operational activities
- Improve interface with designated CCMD missile defense activities; host/support the headquarters and operations center for the United States Strategic Command Joint Functional Component Command - Integrated Missile Defense
- Maintain and improve the reliability, availability, and maintainability of MDIOC mission critical systems

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	56.161	55.356	55.721	-	55.721
Current President's Budget	54.783	55.356	52.403	-	52.403
Total Adjustments	-1.378	0.000	-3.318	-	-3.318
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-1.378	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	0.000	0.000	-3.318	-	-3.318

Change Summary Explanation

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / *Missile Defense Integration and Operations Center (MDIOC)*	Project (Number/Name) MD22 / *Missile Defense Integration and Operations Center (MDIOC)*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD22: *Missile Defense Integration and Operations Center (MDIOC)*	496.338	51.633	52.519	49.740	-	49.740	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

The Missile Defense Integration and Operations Center (MDIOC) sustains and operates a 24 hours a day, 7 days a week, 365 days a year mission complex for critical research, development, testing, training, and operations for Missile Defense System (MDS) activities. The MDIOC supports the Ground-based Midcourse Defense Mission Control Center Facility, as well as the Command, Control, Battle Management, and Communications (C2BMC) Integration and Test Centers and the C2BMC Experimentation Laboratories. It provides infrastructure support for the Space Tracking and Surveillance System's (STSS) Missile Defense Space Center (MDSC); and the Targets and Countermeasures' (TC) Mission Control Center - Targets (MCC-T). The MDIOC also provides developmental support to the Enterprise Sensors Laboratory (ESL) composed of a common satellite ground station and sensor netting test bed for designated MDS elements. The MDIOC supports MDS test events based on the Integrated Master Test Plan (IMTP). It supports MDS Critical Engagement Conditions testing and analysis through the operation of the Test Execution Control node for distributed MDS ground tests. During system flight tests, the MDIOC provides infrastructure (power; Heating, Ventilation and Air Conditioning; and communications) support to the Flight Test Director and crew, and ensures the protection of facility and test assets throughout the test window. Further, the MDIOC provides the facilities that support operations of the Missile Defense Element, manned by the U.S. Army 100th Missile Defense Brigade, the United States Northern Command (USNORTHCOM) C2BMC Command and Control Center (CCC), the United States Strategic Command's (USSTRATCOM's) Joint Functional Component Command-Integrated Missile Defense (JFCC-IMD) and the Missile Defense Agency (MDA) Warfighter Support Center. In addition, the MDIOC supports the MDA Operations Support Center, which provides situational awareness on the health and status of the end-to-end MDS, and provides network subject matter expertise and technical reach back for the program elements and Combatant Commanders. The MDIOC hosts MDS wargames and exercises in support of the warfighter, and delivers the requisite infrastructure to integrate the modeling and simulation assets that form system-level constructive simulations for full-envelope MDS performance assessments, with surrogate capability for MDS ground tests. The MDIOC maintains a technical repository of MDS Implementation Architectures for real-time operations and configuration control; provides state change management and asset management technical support for the MDS; and provides the technical environment for MDS Watch Officers, Safety Officers, and Information Assurance Officers to perform their assigned duties. The MDIOC also supports the operations of the Joint Early Warning Laboratory (JEWL), which provides USSTRATCOM with quick response analyses of real-world launches, and rapid anomaly identification and resolution.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Infrastructure Systems and Support	18.511	18.476	15.962
Articles:	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603904C / *Missile Defense Integration and Operations Center (MDIOC)*	**Project (Number/Name)** MD22 / *Missile Defense Integration and Operations Center (MDIOC)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Description: RECURRING: MDIOC Communications and Special Purpose Processing Node (SPPN): - Establish a DoD compliant SPPN capable of meeting the unique network and data center services required to develop and deploy a layered MDS to defend the United States - Provide distinctive specifications and provisioning requirements associated with the MDA Research, Development, Test and Evaluation (RDT&E) Mission - Provide capabilities that dynamically interconnect and integrate multiple RDT&E systems to large data sets, and enable collaboration in near real-time with National Research Laboratories and Test Ranges; and Defense Industrial Base industry partners throughout the MDS acquisition lifecycle - Construct the SPPN infrastructure with routers, switches, firewalls, and intrusion detection systems that provide IT support to over 10,500 MDA classified/unclassified users worldwide - Provide network operations and network monitoring; development of detailed solutions, designs, and plans; Disaster Recovery and Continuity of Operations rehearsals; internet access management; and web filtering - Sustain core communications distribution services across the MDA Enterprise - Plan, engineer, and implement sustainment projects for general IT services and business systems consistent with the IT architecture roadmap - Acquire and distribute mission critical unclassified and secure communication capability to resident MDA elements/components and MDS and Warfighter operational elements - Provide computer hosting of specified threat models and support the integration of other threat tools as required End User Support: - Sustain End User core service support via an Integrated Service Desk 24 hours a day, 7 days a week, 365 days a year for administrative and business information systems for unclassified and classified users - Monitor networks for user compliance with DoD policies and report incidents - Maintain Printing and Copy Services - Sustain email services (Exchange servers, BlackBerry Enterprise Services servers and archiving storage area networks) - Sustain file services (file servers and storage area networks) - Maintain Directory Services (Active Directory and domain controller servers)			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603904C / *Missile Defense Integration and Operations Center (MDIOC)*	**Project (Number/Name)** MD22 / *Missile Defense Integration and Operations Center (MDIOC)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Maintain Authentication services (Public Key Infrastructure/Common Access Card) - Maintain current hardware and software licenses for IT operational systems - Maintain IT life-cycle asset management of end user devices (desktops, laptops, monitors, printers, thin clients, and BlackBerrys) Hardware and Software Asset Management: - Manage government property and IT hardware and software in accordance with the Federal Acquisition Regulations (FAR)/DoD FAR Supplements (DFARs) to include accountability, reporting, warehouse management, asset transportation and excess asset management - Maintain an inventory of IT hardware and software assets connected or used in the Unclassified Local Area Network (ULAN), Classified Local Area Network (CLAN), Secret Internet Protocol Router Network (SIPRNET) and Top Secret/Special Compartmented Information (TS/SCI) networks - Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE ***FY 2022 Plans:*** - SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects a realignment of engineering rigor and configuration management efforts from Network Infrastructure and Support to Facilities Mission Engineering and Event Support.			
Title: Facilities and Maintenance	14.548	12.417	11.860
Articles:	-	-	-
Description: RECURRING: Host Tenant Support (Electrical, Gas, Sewer, Water, Steam, Chilled Water, Waste Water, Landscaping, Refuse Removal, and Communications Support): - Procure utility services through 50th Air Force Space Wing (Host Base) - Sustain utility infrastructure and delivery systems Environmental, Safety and Occupational Health (ESOH): - Maintain and update the program accident prevention plan - Provide required industrial safety training to facility services personnel - Procure and distribute personal protection equipment for contracted activities			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603904C / *Missile Defense Integration and Operations Center (MDIOC)*	**Project (Number/Name)** MD22 / *Missile Defense Integration and Operations Center (MDIOC)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Ensure compliance with Hazardous Waste, Hazardous Material Recycling, and National Environmental Policy Act (NEPA) programs - Conduct recurring safety and environmental audits Facilities Operations and Sustainment: - Provide 24 hours a day, 7 days a week, 365 days a year, facility maintenance break/fix response for all facility systems (electrical; Heating, Ventilation, and Air Conditioning; plumbing; locksmith) with a response time of 15 minutes after normal duty hours - Conduct preventative maintenance inspections (PMIs) for all building systems Facilities Engineering: - Conduct Management Process Facility Installation Standard Audits - Provide risk management analysis and mitigation plans - Maintain infrastructure drawings and configuration management databases - Develop and document facility long range planning programming - Provide consulting services, preliminary designs and engineering rough order of magnitude estimates for required infrastructure buildout changes Missile Defense Integration and Operations Center (MDIOC) Operating Expenses: - Lease General Services Administration (GSA) vehicles and a commercial warehouse - Calibration of measuring and monitoring equipment - Repair of classified and unclassified networks Facility Services: - Provide custodial services for over 675,000 square feet of floor space in Buildings 720 and 730 - Provide Copy Center and Shuttle Services for over 2,000 personnel - Provide in and out of civilian and contractor support services personnel - Conduct personnel moves to include cubicle and workstation setup, teardown, and reconfiguration - Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE ***FY 2022 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603904C / *Missile Defense Integration and Operations Center (MDIOC)*	**Project (Number/Name)** MD22 / *Missile Defense Integration and Operations Center (MDIOC)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Engineering and Event Services	10.977	13.951	15.317
Articles:	-	-	-
Description: RECURRING: - Provide Mission Assurance by ensuring the successful execution of Concurrent Test, Training, and Operations (CTTO) activities at the MDIOC facility - Ensure independent verification, and coordinate customer validation of all activities, work products and requirements fulfilled by MDIOC Engineering - Provide Risk Management by identifying, assessing, and prioritizing risks. Coordinate resources to minimize, monitor and control the probability and impact of events. Develop strategies to manage threats, including avoidance, reduction, transfer and retention - Ensure Coordination and Integration through a proactive approach of sharing critical information necessary for the successful conduct of CTTO activities in a dynamic environment - Provide Systems Engineering by developing effective solutions through a structured, repeatable process for MDIOC engineering activities. Provide governance and training to stakeholders, enforce policy, establish and maintain a unified board structure for the vetting and implementation of requirements - Ensure Configuration Management so that CTTO events are not disrupted by multiple competing activities - Maintain the Technical Baseline to establish a common reference, and implement a formalized process that provides stability across the MDIOC - Provide Change Management to the Technical Baseline, IT, and MDIOC physical infrastructure. Research how any changes may affect CTTO activities, and determine when change is least likely to impact key functionality. Ensure all changes, across the technical baseline, are clearly recorded and identified on a near-real-time basis - Provide effective requirements management by documenting decisions and information generated during requirements development in conjunction with the design solution processes			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603904C / *Missile Defense Integration and Operations Center (MDIOC)*	**Project (Number/Name)** MD22 / *Missile Defense Integration and Operations Center (MDIOC)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Provide Event Architecture and Engineering Design by coordinating design and implementation of technical architectures for all major MDIOC hosted/supported CTTO activities. Maintain a repository of architectures for real-time configuration management - Provide cradle to grave event management for MDIOC supported CTTO events - Provide a Mission Planning Element to oversee the event support life cycle provided by the MDIOC engineering and event support platform. Ensure the fulfillment of technical, personnel, facility, and cybersecurity requirements - Provide a Mission Execution Element to ensure asset protection and incident response for all MDIOC supported CTTO events - Ensure Organizational Integration by establishing and enforcing seamless integration across the MDIOC. Provide a repeatable process for information sharing and coordination - Provide Cybersecurity to ensure the protection of MDIOC networks, computers, programs and data from attack, damage or unauthorized access - Provide Contract Program Management including business, finance, contract administration and management. Identify and manage cross-project dependencies. Conduct activities within established cost, schedule, and performance parameters - Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE ***FY 2022 Plans:*** - SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides a realignment of engineering rigor and configuration management effort from Network Infrastructure and Support to Facilities Mission Engineering and Event Support.			
Title: Operations and Sustainment	3.850	4.198	3.272
Articles:	-	-	-
Description: RECURRING: - Includes Civilian and Contract Service Support for operations and sustainment of all Missile Defense Integration and Operations Center (MDIOC) activities contributing to the mission execution platform - Provide quality event planning, coordination, logistics, security access and host support for all MDIOC events and visitors - Deliver integrated service coordination for all MDIOC event and protocol support			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603904C / *Missile Defense Integration and Operations Center (MDIOC)*	**Project (Number/Name)** MD22 / *Missile Defense Integration and Operations Center (MDIOC)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Training and Travel - Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE ***FY 2022 Plans:*** - SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Infrastructure Systems Repair, Sustainment, and Critical Upgrades	3.747	3.477	3.329
Articles:	-	-	-
Description: RECURRING: - Heating, Ventilation, and Air Conditioning end-of-life component replacement and capacity upgrade to improve mission assurance to critical mission areas within Building 720; Fire Suppression System Compliance Project - Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE ***FY 2022 Plans:*** - SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	51.633	52.519	49.740

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603881C: *Ballistic Missile Defense Terminal Defense Segment*	295.312	312.317	277.949	-	277.949	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603904C / *Missile Defense Integration and Operations Center (MDIOC)*	**Project (Number/Name)** MD22 / *Missile Defense Integration and Operations Center (MDIOC)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603882C: *Ballistic Missile Defense Midcourse Defense Segment*	1,275.414	1,219.261	745.144	-	745.144	-	-	-	-	-	-
• 0603890C: *BMD Enabling Programs*	630.196	616.455	595.301	-	595.301	-	-	-	-	-	-
• 0603892C: *AEGIS BMD*	722.582	877.336	732.512	-	732.512	-	-	-	-	-	-
• 0603896C: *Ballistic Missile Defense Command and Control, Battle Management & Communication*	550.513	645.741	603.448	-	603.448	-	-	-	-	-	-
• 0603898C: *Ballistic Missile Defense Joint Warfighter Support*	51.095	49.560	50.594	-	50.594	-	-	-	-	-	-
• 0603914C: *Ballistic Missile Defense Test*	398.939	365.208	362.906	-	362.906	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The Integrated Research and Development for Enterprise Solutions (IRES) Contract is the major performing integrated contract. The acquisition strategy for MDIOC mission execution is to employ a contract to perform designated integration and sustainment tasks to conduct MDS Research, Development, Test and Evaluation (RDT&E). The MDIOC is operated by missile defense subject matter experts composed of government, military, civilian personnel, MDIOC Contract Support Services, and major defense contractors.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603904C / *Missile Defense Integration and Operations Center (MDIOC)*	**Project (Number/Name)** MD22 / *Missile Defense Integration and Operations Center (MDIOC)*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Infrastructure Systems and Support - Infrastructure Systems and Support - MDIOC JRDC/IRES	C/CPAF	MDIOC/Northrop Grumman Mission Systems : Colorado Springs, CO	190.805	0.000		0.000		0.000		-		0.000	0.000	190.805	0.000
Infrastructure Systems and Support - Network Infrastructure Systems/ Support	C/CPIF	MDIOC/Jacobs Technology Inc. : Colorado Springs, CO	1.000	18.511	Nov 2019	18.476	Dec 2020	15.962	Dec 2021	-		15.962	Continuing	Continuing	Continuing
Facilities and Maintenance - MDIOC Custodial/ Mailroom/Drivers	C/FFP	MDIOC/Ability One/ Venturi : Colorado Springs, CO	6.742	1.992	Dec 2019	2.032	Dec 2020	2.122	Nov 2021	-		2.122	Continuing	Continuing	Continuing
Facilities and Maintenance - MDIOC GSA / Leases	MIPR	GSA, Warehouses : Colorado Springs, CO	8.344	0.260	Oct 2019	0.278	Nov 2020	0.277	Nov 2021	-		0.277	Continuing	Continuing	Continuing
Facilities and Maintenance - MDIOC IRES	C/CPIF	MDIOC/Jacobs Technology Inc. : Colorado Springs, CO	13.273	8.500	Jan 2020	6.257	Dec 2020	5.534	Nov 2021	-		5.534	Continuing	Continuing	Continuing
Facilities and Maintenance - MDIOC MIPR	C/FFP	Raytheon/Hill AFB : Colorado Springs, CO	93.640	0.424	Nov 2019	0.405	Nov 2020	0.413	Nov 2021	-		0.413	Continuing	Continuing	Continuing
Facilities and Maintenance - MDIOC Utilities	MIPR	50th Space Wing : Schriever AFB, CO	26.596	3.372	Oct 2019	3.445	Oct 2020	3.514	Oct 2021	-		3.514	Continuing	Continuing	Continuing
Engineering and Event Services - Facilities Mission Engineering and Event Support	C/CPAF	MDIOC /Jacobs Technology Inc. : Colorado Springs, CO	83.716	10.977	Nov 2019	13.951	Nov 2020	15.317	Nov 2021	-		15.317	Continuing	Continuing	Continuing
Operations and Sustainment - Civilian Salaries	Allot	MDIOC : Colorado Springs, CO	28.606	1.938	Oct 2019	2.391	Oct 2020	1.634	Oct 2021	-		1.634	Continuing	Continuing	Continuing
Operations and Sustainment - Support Services	C/CPFF	MiDAESS/TEAMS Various : Colorado Springs, CO	22.807	1.862	Oct 2019	1.757	Oct 2020	1.620	Nov 2021	-		1.620	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603904C / *Missile Defense Integration and Operations Center (MDIOC)*	**Project (Number/Name)** MD22 / *Missile Defense Integration and Operations Center (MDIOC)*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Operations and Sustainment - Travel and Training	Allot	MDIOC : Colorado Springs, CO	0.803	0.050	Nov 2019	0.050	Oct 2020	0.018	Nov 2021	-		0.018	Continuing	Continuing	Continuing
Infrastructure Systems Repair, Sustainment, and Critical Upgrades - MDIOC IRES	C/CPAF	MDIOC/Jacobs Technology Inc. : Colorado Springs, CO	20.006	3.747	Jan 2020	3.477	Dec 2020	3.329	Dec 2021	-		3.329	Continuing	Continuing	Continuing
		Subtotal	496.338	51.633		52.519		49.740		-		49.740	Continuing	Continuing	N/A

Remarks

Funds for utilities and base communications are specified in the Inter-service Support Agreement with the 50th Space Wing. In addition, the Missile Defense Integration and Operations Center (MDIOC) provides Technical Contract Support Services employees, for MDIOC operations and oversight of the Integrated Research and Development for Enterprise Solutions (IRES) contract, as well as funding for IRES work as required by the government.

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	496.338	51.633		52.519		49.740		-		49.740	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603904C / *Missile Defense Integration and Operations Center (MDIOC)*	**Project (Number/Name)** MD22 / *Missile Defense Integration and Operations Center (MDIOC)*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
Re-purpose basement space to accommodate IT and Infrastructure support personnel (Phase IV)	✦	✦																										
Heating, Ventilation, and Air Conditioning end-of-life component replacement and capacity for Building 720 (one quadrant) 2020	✦	✦	✦	✦																								
Install Ambient Air Economizer (greening initiative) 2020	✦	✦	✦	✦																								
Replace Heating, Ventilation, and Air Conditioning (HVAC) Chilled Water Pumps (North and South Loops) 2020	✦	✦	✦	✦																								
Fire Suppression System Compliance Project (two quadrants)(FY 2020)		✦	✦	✦																								
Heating, Ventilation, and Air Conditioning end-of-life component replacement and capacity for Building 720 (one quadrant) 2021					✧	✧	✧	✧																				
Fire Suppression System Compliance Project (two quadrants)(FY 2021)						✧	✧	✧																				
Availability/Arc Flash/Short Circuit Coordination Study 2021							✧																					
Heating, Ventilation, and Air Conditioning end-of-life component replacement and capacity for Building 720 (one quadrant) 2022									✧	✧	✧	✧																
Fire Suppression System Compliance Project (two quadrants) (FY 2022)									✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603904C / *Missile Defense Integration and Operations Center (MDIOC)*	**Project (Number/Name)** MD22 / *Missile Defense Integration and Operations Center (MDIOC)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Re-purpose basement space to accommodate IT and Infrastructure support personnel (Phase IV)	1	2020	2	2020
Heating, Ventilation, and Air Conditioning end-of-life component replacement and capacity for Building 720 (one quadrant) 2020	1	2020	4	2020
Install Ambient Air Economizer (greening initiative) 2020	1	2020	4	2020
Replace Heating, Ventilation, and Air Conditioning (HVAC) Chilled Water Pumps (North and South Loops) 2020	1	2020	4	2020
Fire Suppression System Compliance Project (two quadrants)(FY 2020)	2	2020	4	2020
Heating, Ventilation, and Air Conditioning end-of-life component replacement and capacity for Building 720 (one quadrant) 2021	1	2021	4	2021
Fire Suppression System Compliance Project (two quadrants)(FY 2021)	2	2021	4	2021
Availability/Arc Flash/Short Circuit Coordination Study 2021	3	2021	3	2021
Heating, Ventilation, and Air Conditioning end-of-life component replacement and capacity for Building 720 (one quadrant) 2022	1	2022	4	2022
Fire Suppression System Compliance Project (two quadrants) (FY 2022)	1	2022	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / *Missile Defense Integration and Operations Center (MDIOC)*	Project (Number/Name) MC22 / *Cyber Operations*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MC22: *Cyber Operations*	3.211	0.618	0.638	0.638	-	0.638	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

The Missile Defense Integration and Operations Center (MDIOC) conducts Cyber Defensive Operations through Key Management Infrastructure and Information Assurance Training which interfaces with the Information Technology/Information Assurance Enterprise to provide secure communications, network health and status monitoring, mission critical restoral capability, and technical expertise.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Cyber Defensive Operations	0.618	0.638	0.638
Articles:	-	-	-

Description: RECURRING:
The Missile Defense Integration and Operations Center (MDIOC) conducts Defensive Cyber Operations in the following categories:
Key Management Infrastructure
- Interface with the Information Technology/Information Assurance Enterprise to provide for the generation, production, control and distribution, and training for utilizing the keying material used with the Agency's cryptographic devices
Information Assurance Training
- Maintain an Information Assurance (IA) certified workforce through continuous IA training as required by DoD Directive 8570

Specific and/or unique accomplishments to each FY are as follows:

FY 2021 Plans:
- SEE ABOVE

FY 2022 Plans:
- SEE ABOVE

FY 2021 to FY 2022 Increase/Decrease Statement:

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603904C / *Missile Defense Integration and Operations Center (MDIOC)*	**Project (Number/Name)** MC22 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
N/A			
Accomplishments/Planned Programs Subtotals	0.618	0.638	0.638

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603904C / *Missile Defense Integration and Operations Center (MDIOC)*	**Project (Number/Name)** MC22 / *Cyber Operations*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Cyber Defensive Operations - Cyber Defensive Operations	C/CPAF	MDIOC/IRES : Jacobs Technology Inc.	3.211	0.618	Jan 2020	0.638	Jan 2021	0.638	Jan 2022	-		0.638	Continuing	Continuing	Continuing
		Subtotal	3.211	0.618		0.638		0.638		-		0.638	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	3.211	0.618		0.638		0.638		-		0.638	Continuing	Continuing	N/A

Remarks

N/A

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603904C / *Missile Defense Integration and Operations Center (MDIOC)*	**Project (Number/Name)** MC22 / *Cyber Operations*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MC22 Cyber Operations	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603904C / *Missile Defense Integration and Operations Center (MDIOC)*	**Project (Number/Name)** MC22 / *Cyber Operations*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MC22 Cyber Operations	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603904C / *Missile Defense Integration and Operations Center (MDIOC)*	Project (Number/Name) MD40 / *Program-Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program-Wide Support*	24.844	2.532	2.199	2.025	-	2.025	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	2.532	2.199	2.025
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment,			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603904C / *Missile Defense Integration and Operations Center (MDIOC)*	**Project (Number/Name)** MD40 / *Program-Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	2.532	2.199	2.025

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603904C / *Missile Defense Integration and Operations Center (MDIOC)*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Operations Management	Various	Various : Multi: AL, CA, CO, VA	0.867	0.036	Jul 2020	0.000		0.000		-		0.000	0.241	1.144	0.000
Program Wide Support - Agency Operations and Support Services	Reqn	Various : Multi: AK, AL, CA, CO, VA	15.268	2.496	Oct 2019	0.066	Oct 2020	0.046	Oct 2021	-		0.046	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services.	C/CPFF	Various : Alatec INC, AL, CO, VA	0.198	0.000		2.133	May 2021	1.979	Mar 2022	-		1.979	Continuing	Continuing	Continuing
Program Wide Support - Facilities and Maintenance SRM	MIPR	Various : Multi: CO	3.200	0.000		0.000		0.000		-		0.000	0.000	3.200	0.000
Program Wide Support - Prior year no longer funded in the FYDP	Various	Various : Various	5.311	0.000		0.000		0.000		-		0.000	0.000	5.311	0.000
		Subtotal	24.844	2.532		2.199		2.025		-		2.025	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	24.844	2.532		2.199		2.025		-		2.025	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603904C / *Missile Defense Integration and Operations Center (MDIOC)*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603904C / *Missile Defense Integration and Operations Center (MDIOC)*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0603906C / *Regarding Trench*

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	95.473	22.550	11.863	11.952	-	11.952	-	-	-	-	-	-
MD35: *Regarding Trench*	95.473	22.550	11.863	11.952	-	11.952	-	-	-	-	-	-

Program MDAP/MAIS Code: 362

Note

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.

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.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	22.424	11.863	12.192	-	12.192
Current President's Budget	22.550	11.863	11.952	-	11.952
Total Adjustments	0.126	0.000	-0.240	-	-0.240
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	0.126	0.000	-0.240	-	-0.240

Change Summary Explanation

Further program details are reported in accordance with Title 10, United States Code, Section 119(a)(1) in the Special Access Program Annual Report to Congress.

THIS PAGE INTENTIONALLY LEFT BLANK

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 0603907C *I Sea Based X-Band Radar (SBX)*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	814.791	137.604	118.318	147.241	-	147.241	-	-	-	-	-	-
MX46: *Sea Based X-Band Radar Development Support*	784.717	132.537	113.618	141.567	-	141.567	-	-	-	-	-	-
MD40: *Program-Wide Support*	30.074	5.067	4.700	5.674	-	5.674	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

Increase from FY 2021 to FY 2022 provides for Sea Based X-Band Radar (SBX) in-port maintenance period, recurring 2.5-year U.S. Coast Guard/American Bureau of Shipping surveys, and continuation of the radome replacement.

A. Mission Description and Budget Item Justification

The Sea Based X-Band Radar (SBX) is an advanced X-band radar that provides the capability for mid-course acquisition, tracking, discrimination, and hit-assessment of missile threats. The SBX radar is mounted on a mobile, ocean-going, semi-submersible platform, enabling it to cover any region of the globe. The SBX supports the Missile Defense System (MDS) Homeland Defense mission by tracking and discriminating sophisticated Intercontinental Ballistic Missile (ICBM) threats.

The SBX operates at sea for MDS flight and ground test participation or in an active, operational status when indications and warnings signal the need for enhanced discrimination. The SBX is located in a Pacific port when not required at sea. The SBX maintains vessel certifications for operations at sea as well as software compatibility with the MDS.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	128.156	118.318	135.931	-	135.931
Current President's Budget	137.604	118.318	147.241	-	147.241
Total Adjustments	9.448	0.000	11.310	-	11.310
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	9.448	0.000	11.310	-	11.310

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0603907C *I Sea Based X-Band Radar (SBX)*

Change Summary Explanation

Increase in FY 2020 provides realignment of Agency funding from MDS Sensor Test (0604879C) to Sea Based X-Band Radar (0603907C) to initiate SBX radome replacement.

Increase in FY 2022 provides for the continuation of the SBX radome replacement and in-port maintenance.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603907C / *Sea Based X-Band Radar (SBX)*	Project (Number/Name) MX46 / *Sea Based X-Band Radar Development Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MX46: *Sea Based X-Band Radar Development Support*	784.717	132.537	113.618	141.567	-	141.567	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Increase from FY 2021 to FY 2022 provides for SBX in-port maintenance period, recurring 2.5-year U.S. Coast Guard/American Bureau of Shipping surveys, and continuation of the SBX radome replacement.

A. Mission Description and Budget Item Justification

This project provides developmental operations and support of the SBX Radar and its four major sub-systems: the self-propelled vessel; the X-Band Radar (XBR); the In-Flight Interceptor Communications System Data Terminal; and the communications network. Developmental operations and support activities include operation and sustainment of the vessel, developmental operation and sustainment of the XBR, limited XBR software support, and vessel and shore side security. The FY 2022 budget reflects the continued development required to deliver MDS enhanced discrimination capability.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Vessel Operations and Support	66.901	64.347	71.124
Articles:	-	-	-
Description: Vessel Operations and Support provides for sustainment of the SBX vessel for full operations. This effort maintains annual surveys and U.S. Coast Guard Certifications to ensure readiness for operational contingencies, provides for resupply of SBX, and conducts in port and underway maintenance. The SBX participates in MDS ground tests and flight tests per the Integrated Master Test Plan (IMTP). This effort also provides force protection for SBX, maintenance repair, air charter transportation, supply vessel charters, and Variable Speed Drive (VSD) upgrades.			
Specific and/or unique accomplishments to each FY are as follows:			
FY 2021 Plans: - SEE ABOVE.			
FY 2022 Plans: - Conduct in port SBX maintenance period and recurring 2.5-year U.S. Coast Guard/American Bureau of Shipping surveys.			
FY 2021 to FY 2022 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603907C / *Sea Based X-Band Radar (SBX)*	**Project (Number/Name)** MX46 / *Sea Based X-Band Radar Development Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Increase from FY 2021 to FY 2022 provides for SBX in-port maintenance period and recurring 2.5-year U.S. Coast Guard/ American Bureau of Shipping surveys.			
Title: XBR Operations and Support	65.636	49.271	70.443
Articles:	-	-	-
Description: This effort operates and sustains the XBR at full operations, operates and sustains SBX communications systems, performs mission integration functions, and provides support for contingency operations with manning for improved readiness enabling rapid response time from notification to underway. XBR Operations and Support maintains limited software sustainment for system capability with the MDS and fields additional XBR capability to the Warfighter with the MDS capability increment. This effort also provides precision track, discrimination, and hit assessment for engagement support in MDS ground tests and flight tests per the approved IMTP. Additional development efforts include XBR x86 software development and testing for initial fielding to increase the XBR processing capabilities. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - Complete XBR x86 software initial fielding to increase the XBR processing capabilities. - Continuation of radome replacement effort, expected to complete in 2025. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides for the continuation of the radome replacement effort and increased operating costs in the software assurance effort for software quality improvements. In addition, the Mission Integration funding was realigned from Vessel Operations and Support to XBR Operations and Support to better align with mission description.			
Accomplishments/Planned Programs Subtotals	132.537	113.618	141.567

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603882C: *Ballistic Missile Defense Midcourse Defense Segment*	1,275.414	1,219.261	745.144	-	745.144	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603907C / *Sea Based X-Band Radar (SBX)*	**Project (Number/Name)** MX46 / *Sea Based X-Band Radar Development Support*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603884C: *Ballistic Missile Defense Sensors*	348.356	265.803	224.750	-	224.750	-	-	-	-	-	-
• 0603891C: *Special Programs - MDA*	504.031	390.216	413.374	-	413.374	-	-	-	-	-	-
• 0603896C: *Ballistic Missile Defense Command and Control, Battle Management & Communication*	550.513	645.741	603.448	-	603.448	-	-	-	-	-	-
• 0603898C: *Ballistic Missile Defense Joint Warfighter Support*	51.095	49.560	50.594	-	50.594	-	-	-	-	-	-
• 0603904C: *Missile Defense Integration and Operations Center (MDIOC)*	54.783	55.356	52.403	-	52.403	-	-	-	-	-	-
• 0604879C: *Ballistic Missile Defense Sensor Test*	96.082	64.245	77.428	-	77.428	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The SBX is contractor operated and maintained through a variety of contracts between the Navy and MDA. SBX-1 Vessel Management and Security contracts are managed by Military Sealift Command. The SBX radar is operated and maintained on contracts managed by MDA.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603907C / *Sea Based X-Band Radar (SBX)*	**Project (Number/Name)** MX46 / *Sea Based X-Band Radar Development Support*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		-		-		-		-	-	-	N/A

Remarks

N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Vessel Operations and Support - Air Charter	MIPR	Military Sealift Command : VA	0.000	0.000		0.000		1.050	Oct 2021	-		1.050	Continuing	Continuing	Continuing
Vessel Operations and Support - Force Protection	MIPR	Military Sealift Command : VA	5.700	6.381	Oct 2019	6.482	Oct 2020	5.850	Oct 2021	-		5.850	Continuing	Continuing	Continuing
Vessel Operations and Support - Fuel	MIPR	Military Sealift Command : VA	67.355	8.256	Oct 2019	10.535	Oct 2020	8.500	Oct 2021	-		8.500	Continuing	Continuing	Continuing
Vessel Operations and Support - Navy Program Management Office	MIPR	Military Sealift Command : VA	7.920	2.639	Oct 2019	2.910	Oct 2020	3.571	Oct 2021	-		3.571	Continuing	Continuing	Continuing
Vessel Operations and Support - Navy Transition Office	MIPR	U.S. Navy : AL	5.732	0.000		0.000		0.000		-		0.000	0.000	5.732	0.000
Vessel Operations and Support - Operational Support Vessel (OSV Resupply)	MIPR	Military Sealift Command : VA	45.740	17.412	Oct 2019	15.009	Oct 2020	14.600	Oct 2021	-		14.600	Continuing	Continuing	Continuing
Vessel Operations and Support - SBX Operations & Support (Vessel)	MIPR	Military Sealift Command : VA	200.661	23.194	Oct 2019	20.598	Oct 2020	37.553	Oct 2021	-		37.553	Continuing	Continuing	Continuing
Vessel Operations and Support - SBX Vessel Maintenance	MIPR	Tote : HI/NJ	36.963	0.000		0.000		0.000		-		0.000	0.000	36.963	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603907C / *Sea Based X-Band Radar (SBX)*	**Project (Number/Name)** MX46 / *Sea Based X-Band Radar Development Support*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Vessel Operations and Support - Vessel Mission Integration	C/CPIF	Gryphon Tech. : AL/ HI	68.215	9.019	Dec 2019	8.813	Dec 2020	0.000		-		0.000	0.000	86.047	0.000
XBR Operations and Support - Civilian Salaries/ Travel	Allot	MDA : Various	0.000	1.456	Oct 2019	1.893	Oct 2020	1.356	Oct 2021	-		1.356	Continuing	Continuing	Continuing
XBR Operations and Support - Contract Support Services	Various	MDA : Various	0.000	1.200	Oct 2019	1.542	Oct 2020	2.059	Oct 2021	-		2.059	Continuing	Continuing	Continuing
XBR Operations and Support - FFRDC/UARC	MIPR	MITRE : AL	0.000	0.000		0.653	Nov 2020	0.349	Nov 2021	-		0.349	Continuing	Continuing	Continuing
XBR Operations and Support - Mission Integration	C/CPIF	Gryphon Tech : AL/ HI	0.000	0.000		0.000		9.286	Dec 2021	-		9.286	Continuing	Continuing	Continuing
XBR Operations and Support - Network And Infrastructure Services	C/CPAF	Jacobs Engineering : AL, CO, HI, NM, VA	0.420	0.435	Jan 2020	0.439	Jan 2021	0.438	Jan 2022	-		0.438	Continuing	Continuing	Continuing
XBR Operations and Support - SBX Communications Support	SS/CPIF	Boeing : AL/HI	15.541	1.579	Jan 2020	2.520	Jan 2021	2.565	Jan 2022	-		2.565	Continuing	Continuing	Continuing
XBR Operations and Support - XBR Operations & Support	SS/CPFF	Raytheon : AL/AK/HI	330.470	54.466	Dec 2019	35.983	Dec 2020	38.388	Dec 2021	-		38.388	Continuing	Continuing	Continuing
XBR Operations and Support - XBR Operations & Support-Radome Replacement	SS/CPFF	RAYTHEON : MA	0.000	6.500	Sep 2020	6.241	Dec 2020	16.002	Nov 2021	-		16.002	Continuing	Continuing	Continuing
		Subtotal	784.717	132.537		113.618		141.567		-		141.567	Continuing	Continuing	N/A

Remarks

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603907C / *Sea Based X-Band Radar (SBX)*	Project (Number/Name) MX46 / *Sea Based X-Band Radar Development Support*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			-	-		-		-		-		-	-	-	N/A

Remarks

N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			-	-		-		-		-		-	-	-	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	784.717	132.537		113.618		141.567		-		141.567	Continuing	Continuing	N/A

Remarks

Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603907C / *Sea Based X-Band Radar (SBX)*	**Project (Number/Name)** MX46 / *Sea Based X-Band Radar Development Support*

Significant Event Complete ▲ Significant Event Planned △ Milestone Decision Complete ★ Milestone Decision Planned ☆ Element Test Complete ◆ Element Test Planned ◇ System Level Test Complete ● System Level Test Planned ○ Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
GTI-07c (N/I) (MDS Ground Test)	✦																											
GTI-08a (N/I) (MDS Ground Test)				✧	✧	✧	✧	✧																				
FTM-44 (AEGIS 5.1, DT Intercept Flight Test)					▲																							
GTD-08a (N/I) (MDS Ground Test)									✧																			
GTI-08b Sprint 1 (N/I) (MDS Ground Test)										✧																		
FTX-45										△																		
FTX-26 (OT) (SN, OT Target Only Flight Test)											△																	
SICO-08b (MDS Ground Test)											✧																	

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603907C / *Sea Based X-Band Radar (SBX)*	**Project (Number/Name)** MX46 / *Sea Based X-Band Radar Development Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
GTI-07c (N/I) (MDS Ground Test)	1	2020	1	2020
GTI-08a (N/I) (MDS Ground Test)	4	2020	4	2021
FTM-44 (AEGIS 5.1, DT Intercept Flight Test)	1	2021	1	2021
GTD-08a (N/I) (MDS Ground Test)	2	2022	2	2022
GTI-08b Sprint 1 (N/I) (MDS Ground Test)	3	2022	3	2022
FTX-45	3	2022	3	2022
FTX-26 (OT) (SN, OT Target Only Flight Test)	4	2022	4	2022
SICO-08b (MDS Ground Test)	4	2022	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603907C / *Sea Based X-Band Radar (SBX)*	Project (Number/Name) MD40 / *Program-Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program-Wide Support*	30.074	5.067	4.700	5.674	-	5.674	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency program elements (PEs) each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	5.067	4.700	5.674
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment,			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603907C / *Sea Based X-Band Radar (SBX)*	**Project (Number/Name)** MD40 / *Program-Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides the PWS allocation on a pro-rata basis across multiple Agency PE's each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.			
Accomplishments/Planned Programs Subtotals	5.067	4.700	5.674

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603907C / *Sea Based X-Band Radar (SBX)*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Prior year no longer funded in the FYDP	Various	Various : Various	9.154	0.000		0.000		0.000		-		0.000	0.000	9.154	0.000
Program Wide Support - Program Wide Support - Agency Operations Management	Various	Various Multi: : AK, AL, CA, CO, VA	1.994	0.076	Jul 2020	0.142	Jul 2021	0.145	Jul 2022	-		0.145	Continuing	Continuing	Continuing
Program Wide Support - Program Wide Support - Agency Operations and Support Civilian Salaries, Travel, Training	Various	MDA Multi : AK, AL, CA, CO, VA	0.000	0.000		1.606	Jan 2021	0.000		-		0.000	0.000	1.606	0.000
Program Wide Support - Program Wide Support - Agency Operations and Support Other Agency Services (MIPRs)	MIPR	Various Multi: : AK, AL, CA, CO, VA	18.708	4.991	Nov 2019	2.799	Nov 2020	5.395	Nov 2021	-		5.395	Continuing	Continuing	Continuing
Program Wide Support - Program Wide Support - Agency Operations and Support Services (FFP)	C/FFP	Various Multi: : VA, WA	0.218	0.000		0.153	Jun 2021	0.134	May 2022	-		0.134	Continuing	Continuing	Continuing
		Subtotal	30.074	5.067		4.700		5.674		-		5.674	Continuing	Continuing	N/A

Remarks

N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		-		-		-		-	-	-	N/A

Remarks

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603907C / *Sea Based X-Band Radar (SBX)*	Project (Number/Name) MD40 / *Program-Wide Support*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	30.074	5.067		4.700		5.674		-		5.674	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603907C / *Sea Based X-Band Radar (SBX)*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603907C / *Sea Based X-Band Radar (SBX)*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 0603913C / *Israeli Cooperative Programs*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	1,858.391	300.000	300.000	300.000	-	300.000	-	-	-	-	-	-
MD26: *Arrow Weapon System*	674.645	159.000	173.000	173.000	-	173.000	-	-	-	-	-	-
MD34: *Short Range Ballistic Missile Defense (SRBMD) (David's Sling Weapon System (DSWS))*	1,183.746	141.000	127.000	127.000	-	127.000	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

Content supports expected contributions from Israel per international agreements.

A. Mission Description and Budget Item Justification

Since 1986, the United States (U.S.) and the State of Israel have cooperated on missile defense. Currently, the Missile Defense Agency (MDA) has two major projects with Israel to develop and improve their indigenous capability to defend against short and medium range ballistic missiles. These include the Arrow Weapon System (AWS) (MD26) and the Short Range Ballistic Missile Defense (SRBMD) David's Sling Weapon System (DSWS)(MD34). Within these projects MDA along with Israeli Missile Defense Organization (IMDO) develops and produces weapon systems, conducts tests, and exercises interoperability between U.S. Ballistic Missile Defense System (BMDS) and the Israeli Missile Defense Architecture.

The U.S. and State of Israel entered into a Memorandum of Understanding (MOU) on September 2016, in which "Such funding, should over a ten year period beginning in FY 2019 and ending in FY 2028, be provided at a level of $500 million per year." (U.S. contributions only). These funds will be distributed between the Israeli Programs in Research Development Test & Evaluation (RDT&E) and Procurement Funds.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0603913C *I Israeli Cooperative Programs*

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	300.000	300.000	300.000	-	300.000
Current President's Budget	300.000	300.000	300.000	-	300.000
Total Adjustments	0.000	0.000	0.000	-	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	0.000	0.000	0.000	-	0.000

Change Summary Explanation

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603913C / *Israeli Cooperative Programs*	Project (Number/Name) MD26 / *Arrow Weapon System*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD26: *Arrow Weapon System*	674.645	159.000	173.000	173.000	-	173.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This project encompasses the Missile Defense Agency's (MDA) U.S.-Israeli cooperative program for the Israeli AWS Program.

A. Mission Description and Budget Item Justification

Israeli AWS: This system includes block upgrades to the AWS components which enhances capabilities against evolving medium range threats by increasing the total defended area. AWS elements include the Arrow-2 and Arrow-3 missiles and launchers, Citron Tree Battle Management Center (BMC), Green Pine (GP) and Super Green Pine (SGP) Radars, and the Hazelnut Tree Launcher Control Center (LCC).

Arrow Block 5 development incorporates a Long Range Detection Suite (LRDS) that consists of an Unmanned Aerial Vehicle (UAV), Airborne Early Warning System (ABEWS) and Sharp Eye Radar for increased sensor range, early detection and enhanced raid size capacity. In addition, an Arrow-4 interceptor will be developed. The program also includes the continued development of Arrow's interoperability with U.S. BMDS.

The U.S. and State of Israel entered into a Memorandum of Understanding (MOU) on September 2016, in which "Such funding, should over a ten year period beginning in FY 2019 and ending in FY 2028, be provided at a level of $500 million per year." (U.S. contributions only). These funds will be distributed between the Israeli Programs in Research Development Test & Evaluation (RDT&E) and Procurement Funds.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Arrow Weapon System	153.940	167.940	167.940
Articles:	-	-	-
Description: The AWS continues Block 5 spiral development and target development. Included is the integration of Block 5 assets, which consists of the Arrow-3 missile, launcher, LRDS and Arrow-4 interceptor. Continue proven Interoperability with U.S. Assets and enhancements to existing AWS System Components. Specific and/or unique planned accomplishments to each FY are as follows:			
FY 2021 Plans: -Conduct Block 5.0 Flight Test proving improved system performance -Ground Test Integrated Israel- GTI-ISR 21			
FY 2022 Plans: -Continue Block 5.0 and Initiate Block 5.1 Development			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603913C / *Israeli Cooperative Programs*	**Project (Number/Name)** MD26 / *Arrow Weapon System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Conduct Arrow-4 Critical Design Review (CDR) and Launcher Development -Conduct Block 5.0 Flight Test proving improved system performance -Begin System Integration of Sharp Eye Sensors ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Israeli Test Bed (ITB)	3.535	3.535	3.535
Articles:	-	-	-
Description: The Israeli Test Bed (ITB) provides experiments to evaluate Human Machine Interface (HMI) battle management and integration of Block 5 AWS Techniques Tactics and Procedures (TTPs) and CONOPS. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -SEE ABOVE. ***FY 2022 Plans:*** -SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Israeli Systems Architecture and Integration (ISA&I)	1.525	1.525	1.525
Articles:	-	-	-
Description: The Israeli Systems Architecture and Integration (ISA&I) conducts studies to assess Israel's future 2031 Missile Defense Architecture. This identifies the preferred missile defense architecture and reference threat for 10-15 year future epoch and interoperability special studies on regional threats and growth path options. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -SEE ABOVE. ***FY 2022 Plans:*** -SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603913C / *Israeli Cooperative Programs*	**Project (Number/Name)** MD26 / *Arrow Weapon System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
N/A			
Accomplishments/Planned Programs Subtotals	159.000	173.000	173.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208866C: MD26: *Arrow 3 Upper Tier System Procurement*	55.000	77.000	62.000	-	62.000	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The MDA - U.S. Israeli Cooperative Program Office jointly manages the Arrow Program with IMDO to ensure that all systems are delivered with quality, on time, on budget, and meet the needs of the warfighter. The program funding is equitably funded between the U.S. and Israel with Israel providing matching contributions. However, a portion of the Israeli cost share comes from non-financial contributions such as previously completed work prior to joint program initiation. Contracts are awarded by IMDO or MDA, dependent on what is most advantageous to the Joint Governments. In regard to AWS, IMDO contracts on behalf of U.S. government with Israel Aerospace Industries (IAI). IAI subcontracts with Israeli and U.S. companies. For the ITB, the MDA contracts directly with Elbit Systems, Ltd. while IMDO provides an equitable share of the funding to the U.S. Finally, MDA provides funding and contracts directly with WALES, Ltd. for the ISA&I program.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603913C / *Israeli Cooperative Programs*	**Project (Number/Name)** MD26 / *Arrow Weapon System*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Arrow Weapon System - AWS	C/CPFF	Israel Aerospace Industries (IAI) : Israel	607.393	153.940	Dec 2019	167.940	Dec 2020	167.940	Dec 2021	-		167.940	Continuing	Continuing	Continuing
Israeli Test Bed (ITB) - ITB	C/FFP	Elbit Systems : Israel	38.885	3.535	Dec 2019	3.535	Nov 2020	3.535	Nov 2021	-		3.535	Continuing	Continuing	Continuing
Israeli Systems Architecture and Integration (ISA&I) - ISA&I	C/FFP	Wales LTD : Israel	28.367	1.525	Dec 2019	1.525	Dec 2020	1.525	Dec 2021	-		1.525	Continuing	Continuing	Continuing
		Subtotal	674.645	159.000		173.000		173.000		-		173.000	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	674.645	159.000		173.000		173.000		-		173.000	Continuing	Continuing	N/A

Remarks

Contract cost reflect U.S. contribution only.

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603913C / *Israeli Cooperative Programs*	**Project (Number/Name)** MD26 / *Arrow Weapon System*

Significant Event Complete ▲ Significant Event Planned △ Milestone Decision Complete ★ Milestone Decision Planned ☆ Element Test Complete ◆ Element Test Planned ◇ System Level Test Complete ● System Level Test Planned ○ Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
Israeli Test Bed Experiments FY 2020	✦	✦	✦	✦																								
Israeli Test Bed Exercise to include Ground Test (GT) Support FY 2020	✦	✦	✦	✦																								
Arrow Weapon System Flight Test FY 2020	✦	✦	✦	✦																								
Israeli Test Bed Exercise to include Ground Test (GT) Support FY 2021					✧	✧	✧	✧																				
Israeli Test Bed Experiments FY 2021					✧	✧	✧	✧																				
Arrow Weapon System Flight Test FY 2021					✧	✧	✧	✧																				
Israeli Test Bed Experiments FY 2022									✧	✧	✧	✧																
Arrow Weapon System Flight Test FY 2022									✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603913C / *Israeli Cooperative Programs*	**Project (Number/Name)** MD26 / *Arrow Weapon System*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Israeli Test Bed Experiments FY 2020	1	2020	4	2020
Israeli Test Bed Exercise to include Ground Test (GT) Support FY 2020	1	2020	4	2020
Arrow Weapon System Flight Test FY 2020	1	2020	4	2020
Israeli Test Bed Exercise to include Ground Test (GT) Support FY 2021	1	2021	4	2021
Israeli Test Bed Experiments FY 2021	1	2021	4	2021
Arrow Weapon System Flight Test FY 2021	1	2021	4	2021
Israeli Test Bed Experiments FY 2022	1	2022	4	2022
Arrow Weapon System Flight Test FY 2022	1	2022	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603913C / *Israeli Cooperative Programs*	Project (Number/Name) MD34 / *Short Range Ballistic Missile Defense (SRBMD)(David's Sling Weapon System (DSWS))*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD34: *Short Range Ballistic Missile Defense (SRBMD) (David's Sling Weapon System (DSWS))*	1,183.746	141.000	127.000	127.000	-	127.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This project encompasses the Missile Defense Agency's (MDA) U.S.-Israeli cooperative program for the Israeli David's Sling Weapon System Program.

A. Mission Description and Budget Item Justification

Israeli SRBMD, also known as the DSWS, is designed to counter short range rockets, cruise missiles, and tactical ballistic missiles and is integrated into the Israeli Missile Defense Architecture. The DSWS includes the Stunner Interceptor for Block 2 and a modified Stunner for Block 3 Capabilities, Missile Firing Unit (MFU), Multi-Mission Radar (MMR), Launch Site Controller (LSC), Data Link (DL), Elevated Sensor (ES), and the Golden Almond Battle Management Center (BMC).

The United States (U.S.) and State of Israel entered into a Memorandum of Understanding (MOU) on September 2016, in which "Such funding, should over a ten year period beginning in FY 2019 and ending in FY 2028, be provided at a level of $500 million per year." (U.S. contributions only). These funds will be distributed between the Israeli Programs in Research Development Test & Evaluation (RDT&E) and Procurement Funds.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: SRBMD Program	141.000	127.000	127.000
Articles:	-	-	-
Description: The scope of the DSWS covers system development, testing, and integration of spiral software development for Blocks 2-3. Block 2 will add capability to defend against medium range and cruise missiles. Block 3 will provide robust defense capability and add significant detection capability to the Israeli Air Defense Architecture. Recurring Planned Accomplishments include: - Conduct Testing of the DSWS - Continue Blocks 2 and 3 Spiral Development of the DSWS - Establish and Continue Interoperability with Israeli Air Missile Defense Network Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603913C / *Israeli Cooperative Programs*	**Project (Number/Name)** MD34 / *Short Range Ballistic Missile Defense (SRBMD)(David's Sling Weapon System (DSWS))*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Continue DSWS Block 2 Development -Continue Block 3.1 enhanced DSWS capability development -Conduct System Flight Tests			
FY 2022 Plans: -Continue Block 2/3.1 enhanced DSWS capability development -Begin Block 3 Stunner Initial Lot Production (ILP) Long Lead Items -Testing of the Elevated Sensor -Procurement of U.S. Targets for Future DSWS System Tests			
FY 2021 to FY 2022 Increase/Decrease Statement: N/A			
Accomplishments/Planned Programs Subtotals	141.000	127.000	127.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 06028866C: MD34: *Short Range Ballistic Missile Defense (SRBMD)(David`s Sling Weapon System (DSWS)) Procurement*	50.000	50.000	30.000	-	30.000	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The MDA- U.S. Israeli Cooperative Program Office jointly manages the DSWS Program with IMDO to ensure that all systems are delivered with quality, on time, on budget, and meet the needs of the warfighter. The program funding is equitably funded between the U.S. and Israel with Israel providing matching contributions. However, a portion of the Israeli cost share comes from non-financial contributions such as previously completed work prior to joint program initiation. Contracts are awarded by IMDO or MDA, dependent on what is most advantageous to the Joint Governments. In regard to DSWS, IMDO contracts on behalf of U.S. government with Rafael. Rafael subcontracts with Israeli and U.S. companies.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603913C / *Israeli Cooperative Programs*	**Project (Number/Name)** MD34 / *Short Range Ballistic Missile Defense (SRBMD)(David's Sling Weapon System (DSWS))*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SRBMD Program - SRBMD Program	C/CPFF	Rafael : Israel	1,183.746	141.000	Dec 2019	127.000	Dec 2020	127.000	Dec 2021	-		127.000	Continuing	Continuing	Continuing
		Subtotal	1,183.746	141.000		127.000		127.000		-		127.000	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,183.746	141.000		127.000		127.000		-		127.000	Continuing	Continuing	N/A

Remarks

Contract cost reflect U.S. contribution only.
Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603913C / *Israeli Cooperative Programs*	**Project (Number/Name)** MD34 / *Short Range Ballistic Missile Defense (SRBMD)(David's Sling Weapon System (DSWS))*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
System Flight Test #7 FY 2021					✧	✧	✧	✧																				

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603913C / *Israeli Cooperative Programs*	**Project (Number/Name)** MD34 / *Short Range Ballistic Missile Defense (SRBMD)(David's Sling Weapon System (DSWS))*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
System Flight Test #7 FY 2021	1	2021	4	2021

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

THIS PAGE INTENTIONALLY LEFT BLANK

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 0603914C / *Ballistic Missile Defense Test*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	2,881.290	398.939	365.208	362.906	-	362.906	-	-	-	-	-	-
MT04: *BMDS Test Program*	2,710.891	372.533	341.475	337.424	-	337.424	-	-	-	-	-	-
MC04: *Cyber Operations*	52.670	10.902	8.706	8.254	-	8.254	-	-	-	-	-	-
MD40: *Program Wide Support*	117.729	15.504	15.027	17.228	-	17.228	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

N/A

A. Mission Description and Budget Item Justification

Missile Defense Agency (MDA) utilizes a disciplined system engineering process to develop and integrate the Missile Defense System (MDS) into an effective, layered defense against ballistic missiles of all ranges during all phases of flight. This process consists of the following steps: Plan, Define, Design, Build, Test and Verify, Assess, and Deliver MDS Capability, followed by transfer of selected capabilities. The MDS Test Program Element (PE) is responsible for testing that provides critical data to: determine validity of models and simulations used to verify and assess MDS capabilities; validate that Elements and Components are properly designed, built, and integrated; and provide confidence that the MDS will perform as designed. Results from the Test and Verify step provide feedback into the Plan, Define, and Design steps to identify areas for system improvements. Key to the systems engineering process is Modeling and Simulation (M&S), which reflects the integrated operational system's performance. Confidence in M&S is based on a comprehensive Verification, Validation, and Accreditation (VV&A) process. The MDS Test Program, as documented in the Integrated Master Test Plan (IMTP), has a primary emphasis to provide the data necessary to verify and assess MDS capabilities in support of Technical Capability Declarations, and to anchor MDS M&S. As models are validated and accredited, MDA and the MDS Operational Test Agency (OTA) Team will utilize these models to assess MDS capabilities through a campaign of ground testing.

MDS Test Program Functions include:
- Represent MDA as the single test authority to the test and evaluation community, international cooperative program representatives, and other organization representatives
- Develop and implement MDA test policy, standards, tools, products, and processes to enable effective tests while balancing MDA and element programmatic needs
- Develop an IMTP that compiles all MDA test objectives, test schedules, and funding requirements from the year of execution through the Future Years Defense Program (FYDP) time period and beyond
- Act as the single point of contact in MDA for all external ranges and common test resources
- Provide, maintain, and develop common test resources and infrastructure required to execute tests in the MDA Test Program by leveraging element laboratories, ranges, executing agents, and functional expertise, as applicable
- Certify that test personnel are trained and equipped to conduct safe and effective tests
- Provide test personnel and support services to plan and execute tests

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0603914C *I Ballistic Missile Defense Test*

- Collect, archive, and distribute all MDA test data/information

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	399.738	378.302	385.910	-	385.910
Current President's Budget	398.939	365.208	362.906	-	362.906
Total Adjustments	-0.799	-13.094	-23.004	-	-23.004
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-15.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	1.906			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.223	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	-0.576	0.000	-23.004	-	-23.004

Change Summary Explanation

Net decrease in FY 2021 reflects Congressional reduction for prior year test asset carryover and provides a portion of the undistributed Congressional add to restore Defense Wide Review (DWR) Missile Defense Agency manpower reduction.

Decrease in FY 2022 is in accordance with IMTP requirements.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / *Ballistic Missile Defense Test*	Project (Number/Name) MT04 / *BMDS Test Program*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MT04: *BMDS Test Program*	2,710.891	372.533	341.475	337.424	-	337.424	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

The Test Program provides consolidated Missile Defense Agency (MDA) capabilities and resources to support the management and execution of Missile Defense System (MDS) and Element-level testing.

The MDA Test Program is responsible for all MDS testing and relies on MDS Systems Engineering to provide the system test objectives that define the test architecture by developing, updating, coordinating, and assessing the IMTP. The MDA Test Program plans and executes MDS test events and develops the necessary test policy, test plans, and test infrastructure to conduct an effective test program. The goals of this budget project are to sustain and improve a robust testing program and to enhance Modeling and Simulation (M&S) efforts to provide, in conjunction with flight and ground testing, confidence to the Combatant Commanders that the missile defense system works.

Activities are grouped into six major areas: 1) Program Planning and Operations; 2) Flight Test; 3) Ground Test; 4) Test Infrastructure; 5) Engineering Test Analysis; and 6) Joint Emerging Operational Needs (JEON).

Note: MDA has modified the Ground-based Midcourse Defense (GMD) test program to reinforce the Agency's commitment to reducing concurrency risk in the development program and to inform the deployment of Ground-based Interceptors (GBIs) with improved capabilities. Due to the cancellation of the Remote Kill Vehicle (RKV) program, the GMD Flight Test Program is under review.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Planning and Operations	101.683	95.308	95.114
Articles:	-	-	-
Description: The MDS Test program is responsible for the following Program Planning and Operational activities: - Maintain a professional and diverse civilian workforce to plan and execute flight, ground, and cyber test events. - Serve as the MDA Test Interface/Liaison to the Director, Operational Test and Evaluation (DOT&E), Deputy Assistant Secretary of Defense (DASD(DT&E)), Joint Functional Component Command for Integrated Missile Defense (JFCC IMD), Joint Interoperability Test Command (JITC) and the Service Operational Test Agencies (OTA).			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MT04 / *BMDS Test Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Provide MDS OT) System Team resources and funding for civilian salaries and personnel support to conduct system-level test and evaluation activities of the entire MDS portfolio. The MDS OTA Team actively participates in test planning, conduct and report of flight and ground test evaluation activities and conduct cyber assessments of the MDS. - Implement cyber test requirements as directed by the National Defense Authorization Act (NDAA) for Fiscal Year 2016, Pub. L. No. 114-92, Sec. 1647 (a), DOT&E, and DASD(DT&E) to include planning, coordination, and execution of Cooperative Vulnerability and Penetration Assessments, Adversarial Assessments, and Cyber Table Top exercises. - Establish, maintain and execute the MDS Test program budget. - Provide Integrated Master Test Plan cost modeling. - Provide day-to-day Test Functional Area (TFA) management. - Provide Test organizational property accountability. - Establish and standardize Test issuance documents. - Manage Test contracting and acquisition activities as well as manpower activities ensuring proper integration of contracts, support agreements; oversight and maintenance of the Test Directorate Inter/Intra-agency Acquisition Review (IAR) database. - Provide oversight and coordination of test policy guidance to ensure compliance and strategic synchronization across the Test Directorate and the MDA. - Manage travel, including travel to support IMTP flight and ground test events. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Flight Test	34.713	15.398	4.002
Articles:	-	-	-
Description: The Flight Test Execution program solely reflects the IMTP cost model. The program integrates, manages, and executes flight tests using certified personnel and standardized processes and products to support MDS fielding to the warfighter. - Develop flight test training requirements for Test Directors and other console operators. - Implement cyber test requirements as directed by the NDAA for Fiscal Year 2016, Pub. L. No. 114-92, Sec. 1647 (a), Director, Operational Test and Evaluation (DOT&E), and Deputy Assistant Secretary of Defense, Developmental Test and Evaluation			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MT04 / *BMDS Test Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
(DT&E) to include planning, coordination, and execution of Cooperative Vulnerability and Penetration Assessments, Adversarial Assessments, and Cyber Table Top Exercises. - Develop and manage the cyber test organization including plans, policy and strategy, resources, and tracking of information and coordinating Cyber test schedules in support of Flight Tests. - Identify mission risks and implement mitigation practices as required ensuring safe and successful test outcomes. - Provide a Failure Response Team to ensure implementation of the response plan and capture lessons learned for process improvement. - Train test personnel for each flight test and maintain training records for all test personnel. - Train and resource System Mission Managers to lead Integrated Event Test Team mission management and readiness activities across all four test event phases for System and Element flight test and contingency operations. - Complete test planning for MDS Flight Test events. - Conduct mission planning and range coordination activities; provide communications security equipment and management for MDS Flight Test events. - Design and develop the Lessons Learned database. - Execute Flight Test events in accordance with the IMTP schedule. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 is in accordance with the IMTP requirements.			
Title: Ground Test	51.398	61.902	52.409
Articles:	-	-	-
Description: The Ground Test Execution program plans, designs, and executes MDS ground tests in support of flight test risk reduction; MDS fielding decisions; and Doctrine, Organization, Training, Materiel, Leadership and Education, and Personnel and Facilities (DOTMLPF) assessments. In addition, enables the warfighter to effectively employ, maintain, and sustain the MDS and participate in the development of future missile defense capabilities through efficient ground testing. - Conduct System Pre-Mission Tests (SPMTs) as required to support MDS Flight Test Risk Reduction Analysis. - Refine and continue development of the Ground Test Mission Directors, System Mission Manager and Mission Director training plan.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MT04 / *BMDS Test Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Implement cyber test requirements as directed by the NDAA for Fiscal Year 2018, Pub. L. No. 1159, *164, Director, Operational Test and Evaluation (DOT&E), and Deputy Assistant Secretary of Defense, Developmental Test and Evaluation (DT&E) to include planning, coordination, and execution of Cooperative Vulnerability and Penetration Assessments, Adversarial Assessments, and Cyber Table Top Exercises. - Develop and manage the cyber test organization including plans, policy and strategy, resources, and tracking of information and coordinating cyber test schedules in support of the IMTP. - Execute baseline Ground Tests in accordance with the IMTP. Maintain Ground Test Infrastructure: - Execute ground test planning activities supporting MDA test requirements and priorities to include test design, test integration, and international testing. - Verify all test assets and resources are reserved and operationally available to support each test event. - Coordinate requirements for laboratory facilities. - Coordinate and identify communication requirements (e.g., tactical data, truth data, test data, tactical voice and test voice) - Maintain the hardware-in-the-loop (HWIL) Labs and communication test assets. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - Execute the following Ground Tests in FY 2021: GTI-08a, GTI-21 Sprint 1, GTI-21 Sprint 2 Formal Testing. - Plan, coordinate, and execute Cybersecurity Activities in Development and Operations Test (DT/OT) environments (Platform (Element) level and Systems of System Level) as identified in the IMTP for Cyber activities. - Plan, coordinate, and execute Element Cybersecurity Experiments (ECEs) to provide an early cyber assessment of the platforms. - Continue to incorporate cybersecurity testing requirements into the BMDS ground tests. ***FY 2022 Plans:*** - Execute the following Ground Tests in FY 2022: GTD-08a NORTHCOM/USINDOPACOM (N/I), GTI-08b Sprint 1 (N/I), GTI-09 Sprint 1 EUCOM/CENTCOM (E/C), GTI-09 Sprint 2 (E/C), GTD-09 (E/C), GTI-ISR (21). ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects amount of funding transferred from Ground Test to Test Infrastructure.			
Title: Test Infrastructure	137.111	100.412	161.335
Articles:	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MT04 / *BMDS Test Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Description: The MDS Test Program procures, maintains, and manages test resource infrastructure and provides all resources and requirements in support of a robust IMTP schedule in five primary functions: 1) Flight Test Ranges and Infrastructure Upgrades 2) Mobile Instrumentation Systems 3) Airborne Sensors 4) Test Communications 5) Data Management and Labs The primary function responsibilities are as follows: Flight Test Ranges and Infrastructure Upgrades: - Manage, develop, sustain, and modernize MDA test facilities and infrastructure used to support MDS element and system-level flight tests, including range facilities, support vehicles and equipment, fixed and mobile sensors and instrumentation, test communications networks, and test situational awareness tools. - Develop and maintain test execution products that include flight vehicle and ground systems telemetry verification capabilities, good target call data and displays, flight safety data processing, sensor pointing, and data driven Subject Matter Expert (SME) displays. - Facilities Sustainment Restoration/Modernization (FSRM) Funds are required to repair, upgrade, and sustain numerous facilities, test infrastructure, and equipment maintained by MDA world-wide. Mobile Instrumentation Upgrades: - Provide Sea Based Systems (SBS) continued sustainment of test instrumentation ships, Pacific Collector and Pacific Tracker, and associated telemetry and radar systems. Airborne Sensors: - Maintain existing Gulfstream Aircraft (HALOs) that collect radiometric and photo-documentary performance data for strategic and tactical defense systems flight and ground tests. - Three replacements are HALO Fleet Renewal Program procured in FY 2019; Modification work ongoing with HALO-IR scheduled to be completed by 1Q FY 2022 and HALO-IIR and HALO-IIIR completed by 1Q FY 2023. Test Communications: - Provide operations and maintenance support for the Flight Test Communications Network. - Maintain accreditation for the Transportable Telemetry Systems (TTS), Pacific Collector Range Safety System (PCRSS), and the Flight Test Communications Network (FTCN).			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MT04 / *BMDS Test Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Manage, develop, maintain, and modernize the Ground Test (GT) communications network to support Missile Defense System (MDS) ground testing. Data Management and Labs: - Establish authority and maintain configuration control of the test baseline. - Develop, update, coordinate and deliver the IMTP, coordinated within MDA and External stakeholders (Director, Operational Test and Evaluation (DOT&E); the Deputy Assistant Secretary of Defense for Developmental Test and Evaluation (DASD(DT&E)); the Joint Functional Component Command for Integrated Missile Defense (JFCC IMD); the Service Operational Test Agencies (OTAs)); and the Joint Interoperability Test Command (JITC)); and provides an affordable and executable test plan to meet Warfighter needs and National Security commitments. - Coordinate the IMTP Special Access Programs (SAP) Annex with respect to changes to SAP Program Test Baseline and synchronize with the collateral IMTP. - Manage the approved test baseline by assessing all proposed changes to the MDS Test Schedule and Test Configurations for each MDS test event identified in the IMTP. - Support the Developmental Baseline Reviews and the annual MDS Accountability Reviews to assess baseline execution risk and verify MDS components are consistent with the approved test baseline. - Update and maintain the classified Test Resource Mission Planning-Tool (TRMP-T(C)) database. - Execute Flight Test Design Analysis ensuring test designs are safe and sufficient to meet test objectives. - Develop and maintain integrated test tools to support Truth Data Requirements Documents, Truth Data Packages, on-site Truth Quick-Look product development, pre- and post-test analysis test planning, and resource de-confliction; Integrated Data Management Plans (IDMPs), Data Handling Plans (DHPs), Cyber documentation, data planning and management, library operations, deployment process; infrastructure requirements process; and test operations support. - Provide analytical capability for Flight and Ground test planning to include: test design feasibility assessments, truth data and sensor analysis, truth data requirements documentation and data packages; flight safety analysis and flight safety data packages; and telemetry link margin, collision avoidance, and pre- and post-test trajectory analyses. - Review MDS component programs' content on a quarterly basis to ensure consistency with the approved IMTP. - Maintain and extend the Directorate of Test Support System (DTSS) classified Computer Network Defense Service Provider (CNDSP) to support network cyber defense for ground test network systems. Continue to define cyber investments, risks and benefits used to reduce vulnerabilities and protect critical administrative and test data. - Maintain accreditation of the Orion Voice Switch Conferencing System (VSCS). - Co-chair the Signature Working Group to review all signature models and identify technical limitations associated with radar and optical signatures used to support Missile Defense System (MDS) ground and flight testing. - Manage the Missile Defense Data Center (MDDC) Program and its library, operations, and infrastructure providing centralized data management, archival, and distribution services.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MT04 / *BMDS Test Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Provide Range safety risk analysis through model development of target and interceptor debris assessments to determine mission risk assessment for mission risk decisions. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - Prepare to field the first new, Gulfstream-550 based HALO system, HALO-IR in late FY 2021/early FY 2022. - Complete Airborne Sensors Primary Sensor replacement development and testing HALO replacement. - Integrate into HALO-IIR and HALO-IIIR complete ground testing, and prepare for flight testing and fielding in FY 2022. - Implement a distributed communications hub architecture facilitating near-simultaneous flight test mission operations. - Modernize Mobile Communications Suite - 2 (MCS-2) to meet emerging MDA flight test communications requirements for remote sites. - Continue Wake Island projects include Wake Housing Design, replace MDA Diesel Vehicles Fleet, and Building 1512 repairs. - Support Facilities, Sustainment, Restoration, and Modernization (FSRM) efforts. ***FY 2022 Plans:*** - Complete development of HALO-IR and declare Initial Operational Capability (IOC) in support of the Missile Defense System (MDS) test program in 1QFY22; Add next Gen Sensor to HALO-IR and convert over to HALO-IIR configuration to allow for total redundancy throughout the fleet; Retire HALO-I once HALO-IR reaches Full Operational Capability (FOC) in 3Q FY 2022. - Initiate the phased modernization of the X-band Transportable Radar (XTR) in FY 2022. - Continue Wake Island projects, to include; replace heavy equipment; housing design; kitchen/dining design; expand solid waste accumulation capacity; vehicle wash rack facility design. - Begin Meck Island Pipe Pier replacement; Target Launch stand pad construction. - Begin Kauai Test Facility (KTF) Power plant Upgrades. - Establish a White Sands Missile Range (WSMR) infrastructure footprint. - Begin first phase of Meck Island Electrical Distribution Replacement. - Establish the Mission Execution and Display Distribution System (MEDDS) capability to meet flight and ground test execution requirements. - Support Facilities, Sustainment, Restoration, and Modernization (FSRM) efforts. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** - Increase from FY 2021 to FY 2022 provides the following: $33.1M Tech Refresh for laboratories and data centers to continue supporting the IMTP; $18.3M for XTR tech refresh, FSRM projects at test ranges, and O&S to support the last 2 original HALO			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MT04 / *BMDS Test Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
aircraft prior to replacement aircraft testing and acceptance; and $9.5M test component movement from Ground Test to Test Infrastructure.			
Title: Engineering and Test Analysis	26.643	21.291	24.564
Articles:	-	-	-
Description: The Engineering and Test Analysis effort provides essential MDS ground and flight test event planning, execution, and evaluation activities for each test event: - Design test architecture, define test objectives and evaluation criteria, and define target requirements appropriate to the data collection requirements to assess MDS performance and anchor Models and Simulations. - Produce threat data for MDS ground and flight tests. - Coordinate with MDS OTA to address test issues, disposition them, coordinate them, and recommend action plans to achieve closure. - Deliver HWIL M&S integration test cases. - Integrate, test, and deliver end-to-end MDS simulations supporting ground test missions. - Analyze system-level interoperability. - Conduct modeling and technical analysis for Combatant Command Wargames and Exercises. - Utilize M&S for pre-test assessment and post-test review, and M&S updates. - Provide test configuration management risk assessments and anomaly/deficiency review, assessment and closure. - Analyze test results to identify verification and validation data collection shortfalls and reassign objectives to future test events as required. - Document MDS test observations for system-level test anomalies and coordinate the resulting Discrepancy Reports within the Failure Reporting, Analysis, and Corrective Action System (FRACAS). - Upgrade test analysis tools (e.g., Modular Analysis and Reporting Suite (MARS)) to enhance analysis capability and efficiency. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 is in accordance with the IMTP requirements.			
Title: Joint Emerging Operational Need (JEON)	20.985	47.164	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MT04 / *BMDS Test Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Articles:	-	-	-
Description: JEON Testing. - Continue flight and ground testing associated with JEON program per IMTP schedule. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - Complete testing for JEON ***FY 2022 Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the completion of testing associated with JEON.			
Accomplishments/Planned Programs Subtotals	372.533	341.475	337.424

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603890C: *BMD Enabling Programs*	630.196	616.455	595.301	-	595.301	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The MDS Test Program acquisition strategy is consistent with the MDA capabilities-based acquisition strategy that emphasizes testing, evolutionary acquisition, and knowledge-based funding. Test directs a team of various internal staff (government and scientific, engineering and technical assistance support), executing agents (including DoD agencies, Service Organizations, Laboratories and Program Offices, Federally Funded Research and Development Center (FFRDC) and other MDA programs to execute the various diverse efforts within the MDS test program through competition. When a specific effort/activity being conducted, acquired, or maintained requires the use of an executing agent, respective headquarter regulations are used to conform the acquisition strategy.

The MDA IMTP establishes and documents the test requirements for the MDS with the specific focus on collecting the data needed for the Verification, Validation, and Accreditation (VV&A) of the MDS Models and Simulations. This paradigm uses critical factor analysis to drive test design, planning, and execution for accrediting M&S, which is used to validate and assess system performance. With this test approach, MDA will establish confidence that the M&S used to evaluate the MDS represent real world behavior, thereby enabling simulation-based performance assessment to verify system functionality.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MT04 / *BMDS Test Program*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Planning and Operations - Civilian Salaries	Allot	MDA : AL	0.000	0.000		31.508	Nov 2020	31.326	Nov 2021	-		31.326	Continuing	Continuing	Continuing
Program Planning and Operations - IMTP Planning and Data Management Tools	C/FP	Various : AL	140.088	0.000		0.000		0.000		-		0.000	0.000	140.088	0.000
Program Planning and Operations - Lab Analysis Infrastructure	MIPR	MIT-LL/Aerospace : AL/CA/MA	73.204	0.000		0.000		0.000		-		0.000	0.000	73.204	0.000
Program Planning and Operations - MT Contractor Support	C/CPFF	Various : AL/VA/CO/MA	0.000	0.000		0.000		35.565	Nov 2021	-		35.565	Continuing	Continuing	Continuing
Program Planning and Operations - Operational Test Agency	MIPR	ATEC, COTF, AFOTEC, JITC, CCDC, DAC : AL/CO/MD/TX/VA/AZ	118.227	21.624	Nov 2019	24.860	Nov 2020	25.315	Nov 2021	-		25.315	Continuing	Continuing	Continuing
Program Planning and Operations - Support to Flight Testing	C/CPAF	Northrop Grumman/ Lockheed Martin : AL/CO	72.822	0.000		0.000		0.000		-		0.000	0.000	72.822	0.000
Program Planning and Operations - Support to Ground Testing	C/CPAF	MDIOC/JRDC/IRES/ Northrop Grumman : AL/CO/VA/DC	28.675	0.000		0.000		0.000		-		0.000	0.000	28.675	0.000
Program Planning and Operations - Support to Test Resources	C/CPAF	Various : AL	30.969	0.000		0.000		0.000		-		0.000	0.000	30.969	0.000
Program Planning and Operations - Test Functional Management Office	C/CPFF	Various : AL/VA/CO/MA	426.303	80.059	Nov 2019	38.940	Nov 2020	2.908	Nov 2021	-		2.908	Continuing	Continuing	Continuing
Flight Test - IMTP Flight Test	C/Various	Various : L3, ASI, Jacobs / OK / CO	0.000	0.000		0.000		1.181	Oct 2021	-		1.181	Continuing	Continuing	Continuing
Flight Test - IMTP Flight Testing	MIPR	Various OGAs : AL/CO/CA/AK/NM/HI	309.683	34.713	Oct 2019	15.398	Oct 2020	2.821	Oct 2021	-		2.821	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MT04 / *BMDS Test Program*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Flight Test - Layered Homeland Defense	MIPR	Various OGA : AL / CO / AK / NM / HI	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	0.000
Ground Test - Ground Test Infrastructure	MIPR	Various : CA/CO/AL/ NM	47.576	42.588	Oct 2019	60.270	Oct 2020	26.024	Oct 2021	-		26.024	Continuing	Continuing	Continuing
Ground Test - Ground Test Infrastructure MDA contracts	C/CPFF	TBD : AL	0.000	0.000		0.000		25.130	Oct 2021	-		25.130	Continuing	Continuing	Continuing
Ground Test - IMTP Ground Testing	MIPR	AvMC, COLSA : AL/ CA	64.818	8.810	Oct 2019	1.632	Oct 2020	1.255	Oct 2021	-		1.255	Continuing	Continuing	Continuing
Test Infrastructure - Ground Test Infrastructure	MIPR	Naval Information Warfare Systems Command : AL/CA	27.501	0.000		0.000		0.000		-		0.000	0.000	27.501	0.000
Test Infrastructure - Airborne Optics Mobile Assets	C/CPIF	L3 : OK	271.740	35.424	Feb 2020	8.668	Feb 2021	32.973	Oct 2021	-		32.973	Continuing	Continuing	Continuing
Test Infrastructure - Compliance and Accreditations	MIPR	NAWCAD : AL / CA / CO / MD	0.000	0.000		0.000		1.500	Nov 2021	-		1.500	Continuing	Continuing	Continuing
Test Infrastructure - Core Ground Test Labs and HWILS	C/IDIQ	Colsa/CCDC Aviation & Missile Center : AL/MD/FL/ CA/OH/CO	193.698	0.000		0.000		0.000		-		0.000	0.000	193.698	0.000
Test Infrastructure - Enhanced GT Capability Assets	C/IDIQ	Colsa/Northrop Gurmman : AL/CO/ FL/MD/HI	41.604	0.000		0.000		0.000		-		0.000	0.000	41.604	0.000
Test Infrastructure - Facilities Sustainment, Restoration & Modernization	MIPR	SMDC/Northrup Grumman/Colsa : AL/CO/NM	47.852	0.000		0.608	Nov 2020	0.695	Nov 2021	-		0.695	Continuing	Continuing	Continuing
Test Infrastructure - Flight Test Communications	MIPR	NAWCAD, CCDC, SAIC, NRL, Boeing : WSMR / NSWC / CO / AL / NM / MD	0.000	0.000		0.000		16.645	Nov 2021	-		16.645	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MT04 / *BMDS Test Program*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Infrastructure - Flight Test Non-IMTP	MIPR	CCDC - AvMC : AL / GA	0.000	0.000		0.000		0.574	Nov 2021	-		0.574	Continuing	Continuing	Continuing
Test Infrastructure - Flight Test Ranges and Infrastructure	MIPR	WSMR/SNL/PMRF/ ATEC : AL /CA / CO/ FL / HI / NM	101.145	22.807	Nov 2019	10.186	Nov 2020	16.706	Nov 2021	-		16.706	Continuing	Continuing	Continuing
Test Infrastructure - Ground Test Communications	MIPR	CCDC, SAIC : AL / CO	0.000	0.000		0.000		4.274	Oct 2021	-		4.274	Continuing	Continuing	Continuing
Test Infrastructure - IMTP Planning & Data Management Tools	C/CPFF	ASI : AL	47.703	33.725	Nov 2019	28.131	Nov 2020	6.268	Nov 2021	-		6.268	Continuing	Continuing	Continuing
Test Infrastructure - Range and Communication Instrumentation	MIPR	WSMR, CCDC, : AL / FL / NM	0.000	0.000		0.000		4.562	Nov 2021	-		4.562	Continuing	Continuing	Continuing
Test Infrastructure - Sea Based Mobile Assets	MIPR	MARAD/NAWCAD : AL / CA / CR / MD / OR / DC	112.318	15.140	Nov 2019	23.385	Nov 2020	14.807	Nov 2021	-		14.807	Continuing	Continuing	Continuing
Test Infrastructure - Support to Test Resources	MIPR	Various : AL	146.104	0.000		0.000		0.000		-		0.000	0.000	146.104	0.000
Test Infrastructure - Tech Refresh	MIPR	Various : AL / VA / CO / MA	0.000	0.000		0.000		33.096	Nov 2021	-		33.096	Continuing	Continuing	Continuing
Test Infrastructure - Test Communications	C/IDIQ	ASI/WSMR : Gray Research/NRL/ NAWC/CA/MD/DC/ NM/AL/MA	145.325	30.015	Nov 2019	29.434	Nov 2020	0.000		-		0.000	0.000	204.774	0.000
Test Infrastructure - Test Communications MDA contracts	C/CPFF	ASI : AL	0.000	0.000		0.000		29.235	Nov 2021	-		29.235	Continuing	Continuing	Continuing
Engineering and Test Analysis - CSS Support	C/CPFF	TEAMS : AL	34.715	6.111	Nov 2019	6.624	Nov 2020	5.657	Nov 2021	-		5.657	Continuing	Continuing	Continuing
Engineering and Test Analysis - FFRDC/UARC	MIPR	MITRE : VA	3.187	0.000		0.000		0.000		-		0.000	0.000	3.187	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MT04 / *BMDS Test Program*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering and Test Analysis - FFRDC/UARC 2	MIPR	Aerospace : CA	0.840	0.000		0.000		0.000		-		0.000	0.000	0.840	0.000
Engineering and Test Analysis - Industry Support	C/CPAF	Boeing : AL	26.695	0.000		0.000		0.000		-		0.000	0.000	26.695	0.000
Engineering and Test Analysis - Industry Support - NME	C/CPAF	Northrop Grumman-JRDC : CO, AL	2.048	0.000		0.000		0.000		-		0.000	0.000	2.048	0.000
Engineering and Test Analysis - Industry Support 2	C/CPAF	COLSA : AL, CO	0.000	2.332	Nov 2019	2.040	Nov 2020	2.081	Nov 2021	-		2.081	Continuing	Continuing	Continuing
Engineering and Test Analysis - OGA Support	MIPR	CCDC Aviation & Missile Center : AL	106.837	18.200	Nov 2019	12.627	Nov 2020	16.826	Nov 2021	-		16.826	Continuing	Continuing	Continuing
Engineering and Test Analysis - OGA Support - NME	MIPR	LTPO : AL	5.114	0.000		0.000		0.000		-		0.000	0.000	5.114	0.000
Joint Emerging Operational Need (JEON) - JEON	SS/IDIQ	Lockheed Martin : Sunnyvale CA/ Huntsville, AL	84.100	20.985	Nov 2019	47.164	Nov 2020	0.000		-		0.000	0.000	152.249	0.000
		Subtotal	2,710.891	372.533		341.475		337.424		-		337.424	Continuing	Continuing	N/A

Remarks

Recategorized and streamlined MDS Test cost category content to better align test priorities.

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2,710.891	372.533		341.475		337.424		-		337.424	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MT04 / *BMDS Test Program*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
GTI-07c (N/I) (MDS Ground Test)	✦																											
FTX-39 (LTPO, DT Target Only Flight Test)	▲																											
FTP-16 E2 (I8-1) (OTHER, DT Intercept Flight Test)	▲																											
GTI-20 Sprint 1(E/C) (MDS Ground Test)		✦																										
FTP-27 E2 (LTPO, DT/OT Flight Test)		▲																										
FEX-01 (OTHER, DT Tracking Exercise FT)		▲																										
GTI-20 Sprint 2 (JEON) (MDS Ground Test)			✦																									
FTP-27 E1 (LTPO, DT/OT Flight Test)				▲																								
AST-18a				▲																								
Site 4c SICO (MDS Ground Test)				✦																								
GTI-08a (N/I) (MDS Ground Test)				✧	✧	✧	✧	✧																				
TBG-1 (OTHER, DT Tracking Exercise Flight Test)					▲																							
FTM-44 (AEGIS 5.1, DT Intercept Flight Test)					▲																							
HAWC-4 (OTHER, DT Tracking Exercise Flight Test)							▲																					
GTI-21 Sprint 1 (JEON) TH 4.0 (MDS Ground Test)						✧	✧																					
FTX-43 (OTHER, DT Tracking Exercise Flight Test)							△																					
HAWC-5 (OTHER, DT Tracking Exercise Flight Test)							△																					
FTM-31 E1 (AEGIS SBT, DT/OT Intercept Flight Test)							△																					
ASD-1 (MDS Ground Test)							✧																					
TBG-2 (OTHER, DT Tracking Exercise Flight Test)							△																					
FS-21 E1 (AEGIS 5.1, DT Interceptor Only Flight Test)							△																					
FS-21 E2 (AEGIS 5.1, DT Target Only Flight Test)							△																					
FS-21 E3 (AEGIS 5.1, DT Target Only Flight Test)							△																					
FS-21 E4 (AEGIS 5.1, DT Intercept Flight Test)							△																					

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MT04 / *BMDS Test Program*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
FS-21 E5 (AEGIS 5.1, DT/OT Intercept Flight Test)							△																					
FTT-21 (TH, DT Intercept Flight Test)								△																				
ASD-2 (MDS Ground Test)								✧																				
TH CTV-01 (LTPO, DT Interceptor Only Flight Test)								△																				
SM CTV-04 (AEGIS 5.1, DT Interceptor Only Flight Test)								△																				
HAWC-7 (OTHER, DT Tracking Exercise Flight Test)								△																				
HAWC-9 (OTHER, DT Tracking Exercise Flight Test)								△																				
FTM-33 (AEGIS SBT, DT/OT Intercept Flight Test)								△																				
GTI-21 Sprint 2 (MDS Ground Test)								✧																				
GM BVT-03 (GM, DT Interceptor Only Flight Test)								△																				
FTP-21 E1 (P8.1.1)(LTPO, DT Intercept Flight Test)								△																				
FTP-21 E2 (P8.1.1)(LTPO, DT Intercept Flight Test)								△																				
TBG-3 (OTHER, DT Tracking Exercise Flight Test)									△																			
Israeli Cooperative Intercept Flight Test 1 - FY 2021					✧	✧	✧	✧																				
Israeli Cooperative Intercept Flight Test 2 - FY 2021					✧	✧	✧	✧																				
Israeli Cooperative Intercept Flight Test - FY 2022									✧	✧	✧	✧																
GTI-09 Sprint 1 (E/C) (MDS Ground Test)									✧																			
SICO-1 (MDS Ground Test)									✧																			
GTI-ISR (21) (MDS Ground Test)									✧																			
FTP-18 (I8-3) (OTHER, OT Intercept Flight Test)										△																		
FTP-20 (I8-5) (OTHER, OT Intercept Flight Test)										△																		
FTP-19 (I8-4) (OTHER, OT Intercept Flight Test)										△																		
FTM-46 (AEGIS 5.0, DT/OT Intercept Flight Test)										△																		
GTD-08a (N/I) (MDS Ground Test)										✧																		

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MT04 / *BMDS Test Program*

Significant Event Complete ▲ | Significant Event Planned △ | Milestone Decision Complete ★ | Milestone Decision Planned ☆ | Element Test Complete ◆ | Element Test Planned ◇ | System Level Test Complete ● | System Level Test Planned ○ | Complete Activity ✦ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
GTI-09 Sprint 2 (E/C) (MDS Ground Test)										✧	✧																	
FTX-45											△																	
FEM-01											△																	
FTP-25 (P8.1.5) (OTHER, OT Intercept Flight Test)											△																	
FTX-42 (OTHER, DT Target Only Flight Test)											△																	
GTI-08b Sprint 1 (N/I) (MDS Ground Test)											✧																	
PACIFIC DRAGON-22 E1 (AEGIS 5.0, DT/OT Intercept Flight Test)												△																
FTP-21 E3 (P8.1.1)(LTPO, DT Intercept Flight Test)												△																
FTP-23 (LTPO, DT/OT Intercept Flight Test)												△																
FTP-24 (LTPO, DT Intercept Flight Test)												△																
FTX-26 (OT) (SN, OT Target Only Flight Test)												△																
PACIFIC DRAGON-22 E2 (AEGIS 5.0, DT/OT Tracking Exercise Flight Test)												△																
SICO-2 (MDS Ground Test)												✧																
SICO-08b (MDS Ground Test)												✧																
PACIFIC DRAGON-22 E3 (AEGIS 5.0, DT/OT Tracking Exercise Flight Test)												△																
GTD-09 (E/C) (MDS Ground Test)												✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MT04 / *BMDS Test Program*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
GTI-07c (N/I) (MDS Ground Test)	1	2020	1	2020
FTX-39 (LTPO, DT Target Only Flight Test)	1	2020	1	2020
FTP-16 E2 (I8-1) (OTHER, DT Intercept Flight Test)	1	2020	1	2020
GTI-20 Sprint 1(E/C) (MDS Ground Test)	2	2020	2	2020
FTP-27 E2 (LTPO, DT/OT Flight Test)	2	2020	2	2020
FEX-01 (OTHER, DT Tracking Exercise FT)	2	2020	2	2020
GTI-20 Sprint 2 (JEON) (MDS Ground Test)	3	2020	3	2020
FTP-27 E1 (LTPO, DT/OT Flight Test)	4	2020	4	2020
AST-18a	4	2020	4	2020
Site 4c SICO (MDS Ground Test)	4	2020	4	2020
GTI-08a (N/I) (MDS Ground Test)	4	2020	4	2021
TBG-1 (OTHER, DT Tracking Exercise Flight Test)	1	2021	1	2021
FTM-44 (AEGIS 5.1, DT Intercept Flight Test)	1	2021	1	2021
HAWC-4 (OTHER, DT Tracking Exercise Flight Test)	3	2021	3	2021
GTI-21 Sprint 1 (JEON) TH 4.0 (MDS Ground Test)	2	2021	3	2021
FTX-43 (OTHER, DT Tracking Exercise Flight Test)	3	2021	3	2021
HAWC-5 (OTHER, DT Tracking Exercise Flight Test)	3	2021	3	2021
FTM-31 E1 (AEGIS SBT, DT/OT Intercept Flight Test)	3	2021	3	2021
ASD-1 (MDS Ground Test)	3	2021	3	2021
TBG-2 (OTHER, DT Tracking Exercise Flight Test)	3	2021	3	2021
FS-21 E1 (AEGIS 5.1, DT Interceptor Only Flight Test)	3	2021	3	2021
FS-21 E2 (AEGIS 5.1, DT Target Only Flight Test)	3	2021	3	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MT04 / *BMDS Test Program*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
FS-21 E3 (AEGIS 5.1, DT Target Only Flight Test)	3	2021	3	2021
FS-21 E4 (AEGIS 5.1, DT Intercept Flight Test)	3	2021	3	2021
FS-21 E5 (AEGIS 5.1, DT/OT Intercept Flight Test)	3	2021	3	2021
FTT-21 (TH, DT Intercept Flight Test)	4	2021	4	2021
ASD-2 (MDS Ground Test)	4	2021	4	2021
TH CTV-01 (LTPO, DT Interceptor Only Flight Test)	4	2021	4	2021
SM CTV-04 (AEGIS 5.1, DT Interceptor Only Flight Test)	4	2021	4	2021
HAWC-7 (OTHER, DT Tracking Exercise Flight Test)	4	2021	4	2021
HAWC-9 (OTHER, DT Tracking Exercise Flight Test)	4	2021	4	2021
FTM-33 (AEGIS SBT, DT/OT Intercept Flight Test)	4	2021	4	2021
GTI-21 Sprint 2 (MDS Ground Test)	4	2021	4	2021
GM BVT-03 (GM, DT Interceptor Only Flight Test)	4	2021	4	2021
FTP-21 E1 (P8.1.1)(LTPO, DT Intercept Flight Test)	4	2021	4	2021
FTP-21 E2 (P8.1.1)(LTPO, DT Intercept Flight Test)	4	2021	4	2021
TBG-3 (OTHER, DT Tracking Exercise Flight Test)	1	2022	1	2022
Israeli Cooperative Intercept Flight Test 1 - FY 2021	1	2021	4	2021
Israeli Cooperative Intercept Flight Test 2 - FY 2021	1	2021	4	2021
Israeli Cooperative Intercept Flight Test - FY 2022	1	2022	4	2022
GTI-09 Sprint 1 (E/C) (MDS Ground Test)	1	2022	1	2022
SICO-1 (MDS Ground Test)	1	2022	1	2022
GTI-ISR (21) (MDS Ground Test)	1	2022	1	2022
FTP-18 (I8-3) (OTHER, OT Intercept Flight Test)	2	2022	2	2022
FTP-20 (I8-5) (OTHER, OT Intercept Flight Test)	2	2022	2	2022
FTP-19 (I8-4) (OTHER, OT Intercept Flight Test)	2	2022	2	2022
FTM-46 (AEGIS 5.0, DT/OT Intercept Flight Test)	2	2022	2	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MT04 / *BMDS Test Program*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
GTD-08a (N/I) (MDS Ground Test)	2	2022	2	2022
GTI-09 Sprint 2 (E/C) (MDS Ground Test)	2	2022	3	2022
FTX-45	3	2022	3	2022
FEM-01	3	2022	3	2022
FTP-25 (P8.1.5) (OTHER, OT Intercept Flight Test)	3	2022	3	2022
FTX-42 (OTHER, DT Target Only Flight Test)	3	2022	3	2022
GTI-08b Sprint 1 (N/I) (MDS Ground Test)	3	2022	3	2022
PACIFIC DRAGON-22 E1 (AEGIS 5.0, DT/OT Intercept Flight Test)	4	2022	4	2022
FTP-21 E3 (P8.1.1)(LTPO, DT Intercept Flight Test)	4	2022	4	2022
FTP-23 (LTPO, DT/OT Intercept Flight Test)	4	2022	4	2022
FTP-24 (LTPO, DT Intercept Flight Test)	4	2022	4	2022
FTX-26 (OT) (SN, OT Target Only Flight Test)	4	2022	4	2022
PACIFIC DRAGON-22 E2 (AEGIS 5.0, DT/OT Tracking Exercise Flight Test)	4	2022	4	2022
SICO-2 (MDS Ground Test)	4	2022	4	2022
SICO-08b (MDS Ground Test)	4	2022	4	2022
PACIFIC DRAGON-22 E3 (AEGIS 5.0, DT/OT Tracking Exercise Flight Test)	4	2022	4	2022
GTD-09 (E/C) (MDS Ground Test)	4	2022	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / *Ballistic Missile Defense Test*	Project (Number/Name) MC04 / *Cyber Operations*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MC04: *Cyber Operations*	52.670	10.902	8.706	8.254	-	8.254	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

Ballistic Missile Defense (BMD) Test Cyber Operations sustain Missile Defense Agency (MDA) Risk Management Framework (RMF) Standards, Computer Network Defense Service Provider and Controls Validation Testing activities: validation results; risk assessments; and reviews of proposed Program Manager/Information Systems Security Manager (PM/ISSM) Plans of Action and Milestones (POA&Ms) for MDA Ballistic Missile Defense Test program. It maintains the Certification and Accreditation (C&A) data repository, capturing the RMF documentation (artifacts, validation results, and Cyber Risk Assessment results, and Authorizing Official (AO) accreditation decisions) and POA&Ms on all MDA information systems. This project supports the monitoring and tracking of cyber mitigations detailed in Information Technology security POA&Ms. Activities include preparation of C&A documentation and accreditation recommendations to the MDA Senior Information Systems Security Officer/Security Controls Assessor (SCA) and AO. Independent Verification and Validation (IV&V) team actions ensure the availability, integrity, authentication, confidentiality and non-repudiation of the MDA mission, test and administrative systems. Activities in the Project are necessary to comply with the Federal Information Systems Modernization Act (FISMA) of 2014. The MDA Information Technology Networks and Systems and Cross Domain Solution (CDS) provide oversight and guidance for implementing standard CDS security policies across the MDS. The MDA Test Directorate Network Operations Security Center (DNOSC) is the Local Control Center (LCC) (Tier 3) that protects, detects, characterizes, reports, and mitigates cyber threats through real-time continuous monitoring for flight and ground test assets.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Network / System Certification and Accreditation (C&A)	10.902	8.706	8.254
Articles:	-	-	-
Description: The MDS Test Network/System Certification and Accreditation program will: - Provide cyber program oversight of all MDA Test Directorate (DT) information systems, networks, sponsored remote sites, ground and flight test infrastructure, and exercise/war game infrastructures. This includes management of: cyber compliance and authorization; cyber training and awareness; information system secure configuration; assessment and incident management; and computer network defense. - Fund Ballistic Missile Defense Test Program Information Systems Security Manager (ISSM) civilian salaries. - Conduct cyber/information assurance engineering and architecture planning for the MDS Test Program information technology systems. - Plan and test the Cyber controls for MDS.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MC04 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Develop DT National Institute of Standards and Technology (NIST) certification and accreditation packages. - Leverage Cross Domain Solution (CDS) as single authority implementing standard security policies for test and across the MDS. - Maintain and extend the DT Support System (DTSS) classified Computer Network Defense Service Provider (CNDSP) to support network cyber defense for ground test network systems. - Continue to define cyber investments, risks and benefits used to reduce vulnerabilities and protect critical administrative and test data. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	10.902	8.706	8.254

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MC04 / *Cyber Operations*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Network / System Certification and Accreditation (C&A) - Cybersecurity Civ	Allot	MDA : Various	2.151	0.494	Oct 2019	0.520	Oct 2020	0.156	Nov 2021	-		0.156	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Cybersecurity Operations	MIPR	CCDC-AvMC, Colsa, GSA, SAIC : AL	16.329	7.603	Nov 2019	4.319	Nov 2020	5.055	Nov 2021	-		5.055	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - MC Contractor Support	C/CPFF	Various : AL, COS, Belvior, CA, HAFB, KAFB, DAHL, RSA, VAFB	34.190	2.805	Nov 2019	3.867	Nov 2020	3.043	Nov 2021	-		3.043	Continuing	Continuing	Continuing
		Subtotal	52.670	10.902		8.706		8.254		-		8.254	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	52.670	10.902		8.706		8.254		-		8.254	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MC04 / *Cyber Operations*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MC04 Cyber Operations	✦	✦	✦	✦																								
MC04 Cyber Operations Planned					✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MC04 / *Cyber Operations*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MC04 Cyber Operations	1	2020	4	2020
MC04 Cyber Operations Planned	1	2021	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603914C / *Ballistic Missile Defense Test*	Project (Number/Name) MD40 / *Program Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program Wide Support*	117.729	15.504	15.027	17.228	-	17.228	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency Program Element (PEs) each Fiscal Year (FY) based on the total Agency budget, and therefore fluctuates per PE by FY.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	15.504	15.027	17.228
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment,			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MD40 / *Program Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides the PWS allocation on a pro-rata basis across multiple Agency PE's each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year			
Accomplishments/Planned Programs Subtotals	15.504	15.027	17.228

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MD40 / *Program Wide Support*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Operations Management	Various	Various : Multi: AL, CA, CO, VA	5.344	0.232	Jul 2020	0.883	Jul 2021	0.000		-		0.000	0.000	6.459	0.000
Program Wide Support - Agency Operations and Support Other Agency Services	MIPR	Various : Multi: AL, CA, CO, VA	0.245	0.000		5.786	Nov 2020	5.905	Nov 2021	-		5.905	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AL, CA, CO, VA	100.299	15.272	May 2020	8.358	May 2021	11.323	Jun 2022	-		11.323	Continuing	Continuing	Continuing
Program Wide Support - Facilities and Maintenance - SRM	MIPR	Various : Multi: AK,AL,CA,VA	11.841	0.000		0.000		0.000		-		0.000	0.000	11.841	0.000
		Subtotal	117.729	15.504		15.027		17.228		-		17.228	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	117.729	15.504		15.027		17.228		-		17.228	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MD40 / *Program Wide Support*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603914C / *Ballistic Missile Defense Test*	**Project (Number/Name)** MD40 / *Program Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

THIS PAGE INTENTIONALLY LEFT BLANK

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 0603915C / *Ballistic Missile Defense Targets*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	3,429.768	545.764	536.133	553.334	-	553.334	-	-	-	-	-	-
MC05: *Cyber Operations*	6.989	0.890	1.698	1.484	-	1.484	-	-	-	-	-	-
MT05: *BMDS Targets Program*	3,287.778	529.029	513.139	532.690	-	532.690	-	-	-	-	-	-
MD40: *Program Wide Support*	135.001	15.845	21.296	19.160	-	19.160	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

Increase from FY 2021 to FY 2022 provides for initiation of SRBM Pathfinder Zombie target manufacturing; further SRBM T4 hardware and kit development requirements; development efforts for an alternate advanced target re-entry vehicles to support the Glide Phase Interceptor flight test requirements; and initiation of production of 6 additional MRBM T1/T2 targets to support future flight test requirements.

A. Mission Description and Budget Item Justification

The Ballistic Missile Defense System (BMDS) Targets Program provides centrally managed targets and countermeasures development and procurement for a cost effective, integrated system-level approach to MDS testing. Based on engineering assessments of threat intelligence data, the BMDS Targets Program develops, builds, and supports the launch of Short Range Ballistic Missile (SRBM: Less than 1000 Kilometer range) targets, Medium Range Ballistic Missile (MRBM: 1000-3000 Kilometer Range) targets, Intermediate Range Ballistic Missile (IRBM: 3000-5500 Kilometer Range) targets, Intercontinental Ballistic Missile (ICBM: Greater than 5500 Kilometer range) targets, and Multi-Class Components to test, verify, and validate the performance of the MDS against threats. The BMDS Targets Program provides an economical and reliable inventory of targets, which are representative of feasible future threats and supports demonstration of the capability of the evolving layered missile defense system in a simultaneous test and operations threat environment.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	542.939	536.133	593.939	-	593.939
Current President's Budget	545.764	536.133	553.334	-	553.334
Total Adjustments	2.825	0.000	-40.605	-	-40.605
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	1.800	0.000			
• SBIR/STTR Transfer	-0.023	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency					Date: May 2021
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 0603915C *I Ballistic Missile Defense Targets*			
• Other Adjustment	1.048	0.000	-40.605	-	-40.605

Change Summary Explanation

FY 2020 reflects a Below Threshold Reprogramming from the Strategic Capabilities Office (SCO) which provided $1.8 million to support flight test events.

FY 2020 does not include the enacted rescission of $0.3 million.

Decrease in FY 2022 reflects IMTP flight test adjustments and contractor support service efficiencies.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / *Ballistic Missile Defense Targets*	Project (Number/Name) MC05 / *Cyber Operations*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MC05: *Cyber Operations*	6.989	0.890	1.698	1.484	-	1.484	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

Defense Cyber Operations sustains Missile Defense Agency (MDA) Department of Defense (DoD) Information Assurance Certification and Accreditation Program (DIACAP), Risk Management Framework Standards, Computer Network Defense Service Provider and Controls Validation Testing (CVT) activities; analysis of validation results; risk assessments and reviews of proposed Program Manager/Information Assurance Manager (PM/IAM) Plans of Action and Milestones (POA&Ms) for MDA Ballistic Missile Defense (BMD) Target program. It maintains the Certification and Accreditation (C&A) data repository, capturing the DIACAP documentation (artifacts, validation results, and Information Assurance Risk Assessment results, and Designated Approving Authority (DAA) accreditation decisions) and POA&M on all MDA information systems. This project supports the monitoring and tracking of Cybersecurity mitigations detailed in Information Technology security POA&Ms. Activities include preparation of C&A documentation and accreditation recommendations to the MDA Senior Information Assurance Officer/Certification Authority (CA) and DAA. Independent Verification and Validation (IV&V) team actions ensure the availability, integrity, authentication, confidentiality and non-repudiation of the MDA mission, test and administrative systems. Activities in the Project are necessary to comply with the Federal Information Security Management Act (FISMA).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Network / System Certification and Accreditation (C&A)	0.890	1.698	1.484
Articles:	-	-	-
Description: The Network/Systems C&A project sustains the MDA DIACAP and CVT activities, analysis of validation results, risk assessments and reviews of proposed PM/IAM POA&Ms for MDA BMD Test program mission systems. It maintains the C&A data repository, capturing the DIACAP documentation (artifacts, validation results, and Information Assurance (IA) Risk Assessment results, and DAA accreditation decisions) and POA&M on all MDA information systems.			
Specific and/or unique accomplishments to each FY are as follows:			
FY 2021 Plans: - SEE ABOVE.			
FY 2022 Plans: - SEE ABOVE.			
FY 2021 to FY 2022 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MC05 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
N/A			
Accomplishments/Planned Programs Subtotals	0.890	1.698	1.484

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MC05 / *Cyber Operations*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Network / System Certification and Accreditation (C&A) - Windows 10 Upgrade	C/CPAF	Northrop Grumman Space Systems (NGSS) : Chandler, AZ	5.000	0.000		0.000		0.000		-		0.000	0.000	5.000	0.000
		Subtotal	5.000	0.000		0.000		0.000		-		0.000	0.000	5.000	N/A

Remarks

N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Network / System Certification and Accreditation (C&A) - Information Assurance 1	Allot	Missile Defense Agency : Huntsville, AL	0.347	0.138	Nov 2019	0.182	Nov 2020	0.156	Nov 2021	-		0.156	Continuing	Continuing	Continuing
		Subtotal	0.347	0.138		0.182		0.156		-		0.156	Continuing	Continuing	N/A

Remarks

N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Network / System Certification and Accreditation (C&A) - Information Assurance 2	C/IDIQ	MiDAESS/TEAMS : Huntsville, AL	1.642	0.752	Nov 2019	1.516	Nov 2020	1.328	Nov 2021	-		1.328	Continuing	Continuing	Continuing
		Subtotal	1.642	0.752		1.516		1.328		-		1.328	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MC05 / *Cyber Operations*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks N/A															

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	6.989	0.890		1.698		1.484		-		1.484	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may occur incrementally throughout the year. Previous references to Orbital Sciences Corporation and Northrop Grumman Innovation Systems have been updated to Northrop Grumman Space Systems to reflect current corporate structure.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MC05 / *Cyber Operations*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MC05 Cyber Activities (FY 2020)	✦	✦	✦	✦																								
MC05 Cyber Activities (FY 2021)					✧	✧	✧	✧																				
MC05 Cyber Activities (FY 2022)									✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MC05 / *Cyber Operations*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MC05 Cyber Activities (FY 2020)	1	2020	4	2020
MC05 Cyber Activities (FY 2021)	1	2021	4	2021
MC05 Cyber Activities (FY 2022)	1	2022	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / *Ballistic Missile Defense Targets*	Project (Number/Name) MT05 / *BMDS Targets Program*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MT05: *BMDS Targets Program*	3,287.778	529.029	513.139	532.690	-	532.690	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Increase from FY 2021 to FY 2022 provides for initiation of Short Range Ballistic Missiles (SRBM) Pathfinder Zombie target manufacturing; further T4 hardware and kit development requirements; development efforts for alternate advanced target re-entry vehicles to support the Glide Phase Interceptor flight test requirements; and initial production of 6 additional Medium Range Ballistic Missiles (MRBM) T1/T2 targets to support future flight test requirements.

A. Mission Description and Budget Item Justification

The mission of the BMDS Targets Program is to provide an economical and reliable inventory of targets that are representative of feasible future threats. These targets enable demonstration of MDS capabilities in operationally realistic scenarios. The BMDS Targets Program develops and acquires five target types across four target classes. The classes include: Short Range Ballistic Missiles (SRBM), Medium Range Ballistic Missiles (MRBM), Intermediate Range Ballistic Missiles (IRBM), and Intercontinental Ballistic Missiles (ICBM). The target types (Type 1-5) designate the complexity of the target within its class. Type-1 (T1) targets are simple baseline configurations. Type-2 (T2) targets have increased capability or complexity. Type-3 (T3) targets have unique configurations. Type-4 (T4) targets are subscale targets. Type-5 (T5) targets are advanced targets.

The BMDS Targets Program develops and provides Modified Ballistic Re-Entry Vehicles (MBRV) and Countermeasures that can be used across the spectrum of target types and classes. The BMDS Targets Program provides target digital models that enable the MDA weapon system program offices to simulate end to end sensor and interceptor performance during pre-mission analysis. The BMDS Targets Program also provides maintenance, aging surveillance, refurbishment, and routine testing of government furnished equipment boosters and target components.

The BMDS Targets Program carefully plans the year of execution to assure the best use of appropriated funds. However, the BMDS Targets Program must be flexible in its execution of the program in order to respond to emerging real world threats or changes in the intelligence community estimates of when a threat will be deployed. The BMDS Targets Program must also work with MDS systems engineers on a continuing basis to align the targets program to the MDS need to demonstrate capabilities as reflected in the MDS IMTP. The BMDS Targets Program makes every effort to reduce instability in contracts, production base and budget while managing in this dynamic work environment.

The BMDS Targets Program develops and builds targets and countermeasures at multiple locations including: Orlando, FL; Huntsville, AL; and Chandler, AZ. Storage and maintenance facilities are also located throughout the country including: Huntsville, AL; White Sands, NM; Ogden, UT; Tooele, UT; and Cape Canaveral Air Force Station, FL.

The BMDS Targets Program consists of four major areas: Consumables, Program Planning and Operations, Resources, and Flight Test Execution.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MT05 / *BMDS Targets Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Consumables - Short Range Ballistic Missiles (SRBM)	61.013	47.016	87.729
Articles:	-	-	-

Description: Consumables include SRBM target hardware development and manufacturing.

Target development includes non-recurring engineering, MBRVs, Countermeasures, and launch support equipment for BMDS flight testing as required by the MDS IMTP. Target development provides air, sea, and ground launch capabilities to maximize flexibility in MDA test design. Development activities include requirements decomposition, design, modeling and simulation, qualification testing, and characterization. The BMDS Targets Program Office manages target configuration, component interface specifications, range integration, reliability, mission assurance, and costs. The BMDS Targets Program ensures target designs are producible, reliable, and affordable.

Target manufacturing includes the build of targets and target components that are required to execute the MDS IMTP. Manufacturing includes government furnished equipment and new component acquisition, assembly, and integration. Also included are target characterization, quality and mission assurance, transportation, and logistics support. The BMDS Targets Program delivers fully assembled and integrated targets to the BMDS Test Program. Future revisions to the IMTP will likely affect target types and quantities noted in the Planned Accomplishments.

Beginning in FY 2022, the BMDS Targets Program began sequentially numbering SRBM T4 and MRBM T4 ship sets separately.

Specific and/or unique planned accomplishments to each FY are as follows:

FY 2021 Plans:
-SRBM T4 - continue development efforts, continue manufacture of SRBM T4 Ship Sets 1, 2, and 3 to support pre-ship readiness reviews and flight tests in FY 2024
-SRBM Pathfinder Zombie - deliver Ship Set 1 to support pre-ship readiness review and flight test in FY 2021

FY 2022 Plans:
-SRBM T4 - continue development efforts, continue manufacture of SRBM T4 Ship Sets 1, 2, and 3 to support pre-ship readiness reviews and flight tests in FY 2024; initiate manufacture of SRBM T4 Ship Set 4 to support pre-ship readiness review in FY 2026 and flight test in FY 2026
-SRBM Pathfinder Zombie - initiate manufacturing of Ship Set 2 to support pre-ship readiness review and flight test in FY 2023

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MT05 / *BMDS Targets Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Initiate SRBM T4 kit development and manufacturing efforts to support future target performance requirements for flight tests beginning in FY 2024 ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides for initiation of SRBM Pathfinder Zombie target manufacturing and further SRBM T4 hardware and kit development to support future flight tests in accordance with current IMTP requirements			
Title: Consumables - Medium Range Ballistic Missiles (MRBM)	189.407	217.894	251.152
Articles:	-	-	-
Description: MRBM target hardware development and manufacturing is consistent with the Description found in the Consumables-SRBM section. Specific and/or unique planned accomplishments to each FY are as follows: ***FY 2021 Plans:*** -MRBM T4-B - Deliver Ship Sets 24 and 25 to support pre-ship readiness reviews and flight tests in FY 2021 -MRBM Type 3 Configuration 2 (MRBM T3C2) - continue manufacturing of Ship Sets 6 and 7 to support pre-ship readiness reviews and flight tests in FY 2023 (Ship Set 6) and FY 2024 (Ship Set 7) -MBRV-7 - continue recurring engineering efforts and manufacturing of MBRV-7 front sections to support MRBM flight tests in FY 2023 (Ship Sets 3 and 4) and FY 2024 (Ship Sets 5 and 6) -MRBM T1/T2 - continue manufacturing and qualification of Ship Sets 3-6 to support pre-ship readiness reviews and flight tests in FY 2023 (Ship Sets 3 and 4) and FY 2024 (Ship Sets 5 and 6) -MRBM T4 - continue manufacturing of Ship Sets 1-3 to support pre-ship readiness reviews and flight tests in FY 2025 (Ship Set 1) and FY 2026 (Ship Sets 2 and 3) -MRBM T5 Advanced Target - continue development and manufacturing of Ship Sets 1 and 2 to support a pre-ship readiness reviews and flight tests in FY 2023 (Ship Set 1) and FY 2024 (Ship Set 2) -Continue development efforts for MRBM Countermeasures ***FY 2022 Plans:*** -MRBM Type 3 Configuration 2 (MRBM T3C2) - continue manufacturing of Ship Sets 6 and 7 to support pre-ship readiness reviews in FY 2023 and flight tests in FY 2023 (Ship Set 6) and FY 2024 (Ship Set 7) -MBRV-7 - continue recurring engineering efforts and manufacturing of MBRV-7 front sections to support MRBM flight tests -MRBM T1/T2 - continue manufacturing and qualification of Ship Sets 3-6 to support pre-ship readiness reviews and flight tests in FY 2023 (Ship Sets 3 and 4) and FY 2024 (Ship Sets 5 and 6); initiate manufacturing and qualification of Ship Set 7 to support pre-ship readiness review and flight test in FY 2025			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MT05 / *BMDS Targets Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-MRBM T4 - continue manufacturing of Ship Sets 1-3 to support pre-ship readiness reviews in FY 2026 (Ship Set 1) and FY 2027 (Ship Sets 2 and 3) and flight tests in FY 2027; initiate manufacturing of Ship Sets 4 and 5 to support pre-ship readiness reviews and flight tests in FY 2027 -MRBM T5 Advanced Target - continue development and manufacturing of Ship Sets 1 and 2 to support a pre-ship readiness reviews and flight tests in FY 2023 (Ship Set 1) and FY 2024 (Ship Set 2) -Alternate Glide Body (AGB) - continue development efforts and pursue an alternate provider for advanced target re-entry vehicles to support the Glide Phase Interceptor flight test requirements -Award contract option to initiate production of 6 additional MRBM T1/T2 targets to support future flight test requirements -Continue development efforts for MRBM Countermeasures ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides development efforts for an alternate advanced target re-entry vehicles to support the Glide Phase Interceptor flight test requirements and initial production of 6 additional MRBM T1/T2 targets to support future flight test requirements			
Title: Consumables - Intermediate Range Ballistic Missiles (IRBM) ***Articles:*** ***Description:*** IRBM target hardware development and manufacturing is consistent with the Description found in the Consumables-SRBM section. Specific and/or unique planned accomplishments to each FY are as follows: ***FY 2021 Plans:*** -IRBM T1/T2 - continue manufacturing and integration of Ship Sets 10-14 to support pre-ship readiness reviews in FY 2022 (Ship Set 10), FY 2026 (Ship Set 11), and FY 2028 (Ship Sets 12, 13, and 14) -MBRV-8 - perform additional characterization on the MBRV-8 and continue recurring engineering efforts and manufacturing of MBRV-8 front sections to support IRBM flight tests -Continue development efforts for IRBM Countermeasures ***FY 2022 Plans:*** -IRBM T1/T2 - deliver Ship Set 10 to support pre-ship readiness review and flight test in FY 2022; continue manufacturing and integration of Ship Sets 11-14 to support pre-ship readiness reviews in FY 2026 (Ship Set 11) and FY 2028 (Ship Sets 12, 13, and 14) -MBRV-8 - perform additional characterization on the MBRV-8 and continue recurring engineering efforts and manufacturing of MBRV-8 front sections to support IRBM flight tests	49.842 -	55.485 -	26.762 -

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MT05 / *BMDS Targets Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Continue development efforts for IRBM Countermeasures ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects delivery of IRBM T1/T2 Ship Set 10, and reduced hardware purchases and manufacturing for IRBM targets required for the mix of flight tests in accordance with current IMTP requirements			
Title: Consumables - Intercontinental Ballistic Missiles (ICBM) ***Articles:*** ***Description:*** ICBM target hardware development and manufacturing is consistent with the Description found in the Consumables-SRBM section. Specific and/or unique planned accomplishments to each FY are as follows: ***FY 2021 Plans:*** -ICBM T1/T2 - continue manufacturing Ship Sets 5 to support pre-ship readiness review in FY 2024; initiate manufacturing of Ship Set 6 to support pre-ship readiness review in FY 2027 -MBRV-8 - perform additional characterization on the MBRV-8 and continue recurring engineering efforts and manufacturing of MBRV-8 front sections to support ICBM flight tests -Continue development efforts for ICBM Countermeasures ***FY 2022 Plans:*** -ICBM T1/T2 - continue manufacturing Ship Sets 5-6 to support pre-ship readiness reviews in FY 2024 (Ship Set 5) and FY 2027 (Ship Set 6) -MBRV-8 - perform additional characterization on the MBRV-8 and continue recurring engineering efforts and manufacturing of MBRV-8 front sections to support ICBM flight tests -Initiate lot buy of 6 ICBM conversion kits to support future ICBM flight requirements -Initiate ICBM Countermeasures development for Layered Homeland Defense flight test requirements -Initiate SR-119 motor stack development efforts to replace aging C4 motors on ICBM targets -Continue additional development efforts for ICBM Countermeasures ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects reduced hardware purchases and manufacturing for ICBM targets required for the mix of flight tests in accordance with current IMTP requirements	65.115 -	43.484 -	33.947 -
Title: Consumables - Joint Emergent Operational Need Statement (JEON) ***Articles:***	9.600 -	6.564 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MT05 / *BMDS Targets Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Description: Target development and build to support near term capability improvements and Priority 1, 2 and 3 efforts for JEON. The 3 priorities include: 1) Phased Array Tracking Intercept of Target (PATRIOT) launch on remote from Terminal High Altitude Area Defense (THAAD) battery data; 2) THAAD / Missile Segment Enhancement (MSE) Integration Part 1; 3) THAAD remote launcher Part 1. Specific and/or unique planned accomplishments to each FY are as follows: ***FY 2021 Plans:*** - Deliver SRBM Black Dagger Ship Set 1 to support a pre-ship readiness review and JEON flight test in FY 2021 ***FY 2022 Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the completion of JEON testing in FY 2021			
Title: Program Planning & Operations	61.530	60.741	50.998
Articles:	-	-	-
Description: Program Planning and Operations provides for government management of the BMDS Targets Program. Included in this effort is program and business management, program administration, technical and testing oversight, verification of hardware and software development, and government manpower and infrastructure to develop, test and sustain the BMDS Targets Program Office system and components. Other Government Agency (OGA) and Federally Funded Research and Development Research Centers (FFRDC) are used for highly specialized skill sets not available internally to Targets for specific time periods. Recurring yearly planned accomplishments include the following: -Provide technical and business management support activities, financial management, cost and schedule performance analysis cost estimation and analysis, and integration activities -Provide program oversight, subcontract management, quality assurance, verification of hardware and software development, and technical and testing oversight -Ensure BMDS Targets Program compliance with internal and external direction, policies, and regulations -Conduct Internal Program Plans that align with the MDA approved IMTP -Provide program and technical management of target launch operations activities to include oversight of mission planning, range coordination, and mission requirements			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MT05 / *BMDS Targets Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Specific and/or unique planned accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects efficiencies in contractor support services and reduced travel funding.			
Title: Resources	62.696	52.632	49.609
Articles:	-	-	-
Description: BMDS Target Program Resources consist of two sub-elements: Systems Engineering/Program Management and Logistics. Systems Engineering/Program Management provides technical direction to meet Target Program requirements while balancing cost, schedule, performance, and risk. It conducts functional requirements allocation to product lines, defines product line specifications/interfaces, performs configuration and data management, and follows guidelines for design reviews. It performs target system analysis to verify system performance, defines target program baselines, controls flight test configurations, and conducts pre and post-flight analysis. It identifies treaty and environmental issues and develops plans for issue resolution. It provides Quality, Safety, and Mission Assurance operations to ensure compliance with MDA requirements for design, test, manufacturing, quality, safety and reliability to ensure high quality products are delivered for test events. It also includes Single Stimulation Framework (SSF)/Objective Simulation Framework (OSF) compatible Modeling and Simulation (M&S) execution and improvements to evolve M&S capability; trajectory analyses; signature analyses and characterization; studies to assess alternative target and platform solutions; assessments of risk management; and design approval of government furnished equipment. Specific Systems Engineering Planned Accomplishments include: -Continue Program Management and Business Operations for target components to provide a framework for overall management of the BMDS Targets Program -Continue providing classified network connections to OGAs so their subject matter experts can be used to support Target requirements -Continue analyses of future target Launch Vehicles, Re-Entry Vehicles, and launch platforms to ensure they are threat representative and that the Agency is making use of available technology in our future designs -Continue performing Pedigree Reviews to ensure high probability of mission success			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MT05 / *BMDS Targets Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Continue information technology and classified network support to ensure sensitive target information is not compromised -Continue Software IV&V to provide risk reduction of flight missions for target systems under development BMDS Targets Program Logistics support provides target storage, aging surveillance, and transportation of target hardware in support of MDS testing. Also included are integrated logistics support for facilities, inventory maintenance, spare parts, aging surveillance, disposal, special testing for rocket motor propellants, and other hazardous material handling. This task manages and oversees accountability of all government furnished equipment and contractor acquired property. Logistics also provides common support equipment for launch vehicles, MBRVs, countermeasures, and all up integrated target rounds. It also supports launch site activations through the transportation of support equipment to various test sites. Specific Targets Logistics Planned Accomplishments include: -Continue Multi-Class Inventory storage, aging surveillance, maintenance of existing assets, and transportation support that ensured availability of MBRV and ground support equipment -Conduct disposal actions of inert assets Specific and/or unique planned accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Flight Test Execution ***Articles:*** ***Description:*** Flight Test Execution is performed by the Target Launch Operations group. This group conducts target mission planning, coordinates target range and mission requirements, and provides target technical information to the MDA's General Counsel to support treaty approvals. The Target Launch Operations Group is the primary link between the target developer and the MDS test community, incorporating target system constraints into the MDS mission countdown and launch constraints. Specific and/or unique planned accomplishments to each FY are as follows: ***FY 2021 Plans:***	29.826 -	29.323 -	32.493 -

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MT05 / *BMDS Targets Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Conduct final target integration with the test range and launch operations of an MRBM target in support of Aegis BMD BL 9.C2.1 Software demonstrating a salvo engagement (2) firing four SM-6 Dual II -Conduct final target integration with the test range and accomplish launch operations of an SRBM (non-separating) in support of a THAAD Remote Launch Interoperability with PATRIOT -Conduct final target integration with the test range and launch operations of two SRBM (separating) targets in support of Aegis BMD BL 9.C2.1 Software demonstrating two salvo engagements (2) firing four SM-6 Dual II ***FY 2022 Plans:*** -Conduct final target integration with the test range and Forward Staging Area to accomplish launch operations of an IRBM target with countermeasures in support of Aegis BMD SM-3 IIA Full Rate Production Decision -Conduct final target integration with the test range and Forward Staging Area to accomplish launch operations of an MRBM (separating) target in support of the Long Range Discrimination Radar (LRDR) using 1.0 software performing a target scene data collection -Conduct final target integration with the test range and Forward Staging Area to accomplish launch operations of an IRBM target in support of United States Northern Command (USNORTHCOM) Operational Acceptance of the LRDR ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides the number and types of targets required for the mix of flight tests in the MDS IMTP			
Accomplishments/Planned Programs Subtotals	529.029	513.139	532.690

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The BMDS Targets Program delivers targets and countermeasures for MDS flight-testing to counter evolving threats. Program requirements are derived from the MDS IMTP and from multiple Target System Performance Specifications (TSPS).

The BMDS Targets Program is currently in various acquisition and contracting stages to deliver targets and countermeasures per multiple TSPS by target class: SRBM, MRBM, IRBM, and ICBM. Each target class may be independently solicited, evaluated, and competitively awarded based on the IMTP 'need date' priority order. The Targets Program also delivers countermeasures based on requirements and TSPS.

The BMDS Targets Program competitively awarded a prime contract in 2011 to Orbital Sciences Corporation (OSC) (wholly-owned subsidiary of Northrop Grumman Space Systems (NGSS) with a Period of Performance (PoP) of March 2011 through September 2025 for air-launched IRBM targets. This award included two (2) follow-

on options, one (1) for eight (8) IRBM targets exercised in 2014 and another for six (6) IRBM targets exercised in 2017. Two (2) IRBM targets were added on the contract in 2018 to support the MDS Acceleration efforts. This contract also included the development and delivery of ICBM targets. The contract scope included two ICBM Stage Zero Retrofit Kits to be installed in existing air-launched IRBM targets. Four ICBM Stage Zero Kits were added in 2018.

The BMDS Targets Program competitively awarded a prime contract in 2016 to OSC (wholly-owned subsidiary of NGSS) with a PoP of July 2016 to December 2020 for three MRBM T3c2 targets. This award included options for up to four MRBM T3c2 targets. In August 2020 a modification was awarded to extend the base contract through March 2024 to account for two flight tests scheduled for FY 2023.

The BMDS Targets Program competitively awarded a prime contract in 2013 to L-3 Communications/Coleman Aerospace Corporation (now owned by Aerojet Rocketdyne since 2017) with a PoP of October 2013 through December 2027 to provide six MRBM targets. Six additional targets were added to the contract in 2019 to incorporate additional IMTP requirements. There is an expired contract option for six (6) additional targets, which if exercised, will have to be re-negotiated. The first target from this contract was successfully launched in 4th Quarter, FY 2019. Additionally, a quantity of two (2) each enhanced Solid Rocket-19 (eSR-19) motor sets and Roll Control Systems were awarded in 2019.

The BMDS Targets Program competitively awarded a prime contract in 2019 to OSC (wholly-owned subsidiary of NGSS) with a PoP of September 2019 through September 2024 to deliver T4 Subscale Targets. This T4 Subscale contract has a base quantity of four SRBMs, five MRBMs, with options for up to 17 SRBMs and 7 MRBMs.

The T4-G Target and other legacy Aegis Readiness Assessment Vehicles (ARAV) targets are acquired through the Naval Surface Warfare Center Port Hueneme Division White Sands (NSWC PHD WS) via Military Interdepartmental Purchase Requests (MIPRs) funding transactions. NSWC PHD WS has unique sounding rocket expertise and access to existing contracts that makes this a beneficial relationship for both parties.

The BMDS Targets Program also acquires SRBM subscale targets (Black Dagger and Zombie) with special/unique guidance requirements through MIPRs from the US Army Space and Missile Defense Command (USASMDC).

The BMDS Targets Program has one active Delivery Order-29 (DO 29) under its Targets and Countermeasures Program (TCP) Contract. The Targets Program awarded to Lockheed Martin for the delivery of hardware and associated equipment. This effort currently requires the delivery of five (5) MBRVs. The current PoP end date is February 2022.

The BMDS Targets Program competitively awarded a prime contract in 2017 to Lockheed Martin with a base PoP of November 2017 through December 2022. There is currently a contract action in works to extend the period of performance to January 2027. This action will also move from delivery of in-line missionization hardware to delivery of hardware that has been configured to a generic configuration. Based on this concept, missionization will occur once a mission has been identified in IMTP. This effort currently requires the delivery of three (3) MBRV-7 Configuration 2 (C2) and five (5) MBRV-8 C2 targets with options for two (2) MBRV-7 C2 and five (5) MBRV-8 C2 targets, as set forth in the IMTP.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MT05 / *BMDS Targets Program*

The BMDS Targets Program awarded a sole source contract in 2013 to Lockheed Martin with a base PoP of January 2014 through September 2016. The Program Office awarded a contract modification to the Targets and Countermeasures Highly Specialized Services (TCHSS) contract that extended the PoP to September 2021. There is currently a contract action in works to extend the period of performance to September 2027. This effort provides missionization requirements-preparation and flight readiness of target assets, ordnance handling, and execution of mission reviews to support specific flight-test objectives for MBRVs.

The Targets Program initiated development efforts with Johns Hopkins University Applied Physics Lab (JHU APL) for the Alternate Glide Body utilizing an existing contract through MDA's Directorate of Engineering team.

The BMDS Targets Program future acquisition planning and solicitations will go through MDA Acquisition Strategy Panel(s)/Board(s) for decision-making. Future acquisition strategies are based on two premises: a) utilize existing capabilities/infrastructure and sustain an industrial base to deliver targets; and b) initiate acquisitions that delivers low cost/affordable targets that emulate evolving threats.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MT05 / *BMDS Targets Program*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Consumables - Short Range Ballistic Missiles (SRBM) - 10	FFRDC	Sandia National Lab : Albuquerque, NM	8.472	0.000		2.184	Dec 2020	7.023	Dec 2021	-		7.023	Continuing	Continuing	Continuing
Consumables - Short Range Ballistic Missiles (SRBM) - 11	FFRDC	MIT Lincoln Laboratory : Hanscom AFB, Lexington, MA	0.000	0.000		1.022	Dec 2020	0.000		-		0.000	0.000	1.022	0.000
Consumables - Short Range Ballistic Missiles (SRBM) - 12	MIPR	Space and Missile Defense Command : Huntsville, AL	0.072	0.000		4.362	Nov 2020	8.503	Nov 2021	-		8.503	Continuing	Continuing	Continuing
Consumables - Short Range Ballistic Missiles (SRBM) - 13	MIPR	Marshall Space Flight Center : Huntsville, AL	0.169	0.000		0.000		0.000		-		0.000	0.000	0.169	0.000
Consumables - Short Range Ballistic Missiles (SRBM) - 14	MIPR	Defense Finance and Accounting Service : Indianapolis, IN	7.407	0.000		0.000		0.000		-		0.000	0.000	7.407	0.000
Consumables - Short Range Ballistic Missiles (SRBM) - 15	FFRDC	Georgia Tech Research Institute : Huntsville, AL	0.000	0.000		0.000		2.569	Dec 2021	-		2.569	Continuing	Continuing	Continuing
Consumables - Short Range Ballistic Missiles (SRBM) - 2	MIPR	Naval Surface Warfare Center, Port Hueneme : Port Hueneme, CA	86.282	5.413	Nov 2019	2.280	Nov 2020	0.769	Nov 2021	-		0.769	0.000	94.744	0.000
Consumables - Short Range Ballistic Missiles (SRBM) - 7	C/CPAF	Lockheed Martin Space Systems Company : Huntsville, AL	20.965	0.000		0.000		0.000		-		0.000	0.000	20.965	20.965
Consumables - Short Range Ballistic Missiles (SRBM) - 8	C/CPIF	Northrop Grumman Space Systems : Chandler, AZ	8.299	55.380	Nov 2019	36.504	Nov 2020	68.865	Nov 2021	-		68.865	Continuing	Continuing	Continuing
Consumables - Short Range Ballistic Missiles (SRBM) - 9	FFRDC	Johns Hopkins University Applied Physics Laboratory : Laurel, MD	12.643	0.220	Dec 2019	0.664	Dec 2020	0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MT05 / *BMDS Targets Program*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Consumables - Medium Range Ballistic Missiles (MRBM) - 1	C/CPAF	Lockheed Martin Space Systems Company : Huntsville, AL	466.582	15.463	Nov 2019	21.565	Nov 2020	8.568	Nov 2021	-		8.568	Continuing	Continuing	Continuing
Consumables - Medium Range Ballistic Missiles (MRBM) - 10	C/CPAF	Northrop Grumman Space Systems : Chandler, AZ	162.445	41.156	Nov 2019	13.102	Nov 2020	21.767	Nov 2021	-		21.767	Continuing	Continuing	Continuing
Consumables - Medium Range Ballistic Missiles (MRBM) - 11	MIPR	Naval Surface Warfare Center : Crane, IN	0.011	0.000		0.020	Nov 2020	0.000		-		0.000	0.000	0.031	0.000
Consumables - Medium Range Ballistic Missiles (MRBM) - 15	FFRDC	Applied Physics Lab/Johns Hopkins University : Laurel, MD	17.141	2.878	Dec 2019	0.000		24.253	Dec 2021	-		24.253	0.000	44.272	0.000
Consumables - Medium Range Ballistic Missiles (MRBM) - 16	MIPR	Naval Surface Warfare Center : Port Hueneme, CA	0.000	2.966	Nov 2019	0.000		0.000		-		0.000	0.000	2.966	0.000
Consumables - Medium Range Ballistic Missiles (MRBM) - 17	MIPR	Space and Missile Systems Center : Albuquerque, NM	3.321	6.446	Nov 2019	0.000		0.000		-		0.000	0.000	9.767	0.000
Consumables - Medium Range Ballistic Missiles (MRBM) - 18	MIPR	Yuma Proving Grounds : Yuma, AZ	0.316	0.000		0.062	Nov 2020	0.240	Nov 2021	-		0.240	Continuing	Continuing	Continuing
Consumables - Medium Range Ballistic Missiles (MRBM) - 19	MIPR	Air Force Research Laboratory : Wright Patterson AFB, OH	0.187	0.000		0.000		0.000		-		0.000	0.000	0.187	0.000
Consumables - Medium Range Ballistic Missiles (MRBM) - 2	C/CPAF	L3 Communications/ Coleman Aerospace : Orlando, FL	367.143	66.418	Nov 2019	84.915	Nov 2020	124.455	Nov 2021	-		124.455	Continuing	Continuing	Continuing
Consumables - Medium Range Ballistic Missiles (MRBM) - 20	MIPR	Defense Finance and Accounting Service : Indianapolis, IN	0.830	0.000		0.000		0.000		-		0.000	0.000	0.830	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MT05 / *BMDS Targets Program*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Consumables - Medium Range Ballistic Missiles (MRBM) - 21	MIPR	Cape Canaveral 45th Space Wing : Cape Canaveral, FL	0.742	0.000		0.864	Nov 2020	0.770	Nov 2021	-		0.770	Continuing	Continuing	Continuing
Consumables - Medium Range Ballistic Missiles (MRBM) - 22	FFRDC	Georgia Tech Research Institute : Huntsville, AL	4.946	0.000		3.814	Dec 2020	5.440	Dec 2021	-		5.440	Continuing	Continuing	Continuing
Consumables - Medium Range Ballistic Missiles (MRBM) - 23	MIPR	Pacific Missile Range Facility : Barking Sands, HI	1.058	0.000		0.000		0.000		-		0.000	0.000	1.058	0.000
Consumables - Medium Range Ballistic Missiles (MRBM) - 24	MIPR	US Army Redstone Test Center : Huntsville, AL	0.404	0.000		0.000		0.000		-		0.000	0.000	0.404	0.000
Consumables - Medium Range Ballistic Missiles (MRBM) - 25	MIPR	30th Space Wing : Vandenberg AFB, CA	0.242	0.000		0.000		0.000		-		0.000	0.000	0.242	0.000
Consumables - Medium Range Ballistic Missiles (MRBM) - 26	FFRDC	MIT Lincoln Laboratory : Hanscom AFB, Lexington, MA	0.000	0.000		10.446	Dec 2020	11.239	Dec 2021	-		11.239	Continuing	Continuing	Continuing
Consumables - Medium Range Ballistic Missiles (MRBM) - 27	MIPR	National Security Agency : Fort Meade, MD	0.014	0.000		0.000		0.000		-		0.000	0.000	0.014	0.000
Consumables - Medium Range Ballistic Missiles (MRBM) - 28	MIPR	Reagan Test Site : Kwajalein Atoll	0.000	0.000		0.000		0.116	Dec 2021	-		0.116	Continuing	Continuing	Continuing
Consumables - Medium Range Ballistic Missiles (MRBM) - 3	FFRDC	Sandia National Laboratories : Albuquerque, NM	62.067	46.095	Dec 2019	50.796	Dec 2020	23.700	Dec 2021	-		23.700	Continuing	Continuing	Continuing
Consumables - Medium Range Ballistic Missiles (MRBM) - 4	MIPR	Aviation & Missile Research, Dev & Eng Center : Huntsville, AL	29.449	0.000		0.000		1.450	Dec 2021	-		1.450	0.000	30.899	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MT05 / *BMDS Targets Program*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Consumables - Medium Range Ballistic Missiles (MRBM) - 7	MIPR	Space and Missile Defense Command : Huntsville, AL	6.113	0.000		0.000		0.000		-		0.000	0.000	6.113	0.000
Consumables - Medium Range Ballistic Missiles (MRBM) - 8	C/CPAF	Northrop Grumman Space Systems : Chandler, AZ	0.000	7.906	Nov 2019	32.310	Nov 2020	29.095	Nov 2021	-		29.095	Continuing	Continuing	Continuing
Consumables - Medium Range Ballistic Missiles (MRBM) - 9	MIPR	Defense Information Systems Agency : Fort Meade, MD	0.209	0.079	Nov 2019	0.000		0.059	Nov 2021	-		0.059	Continuing	Continuing	Continuing
Consumables - Intermediate Range Ballistic Missiles (IRBM) - 1	C/CPAF	Northrop Grumman Space Systems : Chandler, AZ	615.307	43.745	Nov 2019	49.247	Nov 2020	18.078	Nov 2021	-		18.078	Continuing	Continuing	Continuing
Consumables - Intermediate Range Ballistic Missiles (IRBM) - 12	MIPR	Naval Air Weapons Station : China Lake, CA	0.000	0.121	Nov 2019	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Consumables - Intermediate Range Ballistic Missiles (IRBM) - 15	FFRDC	Sandia National Laboratories : Albuquerque, NM	10.769	1.717	Dec 2019	0.659	Dec 2020	5.466	Dec 2021	-		5.466	Continuing	Continuing	Continuing
Consumables - Intermediate Range Ballistic Missiles (IRBM) - 16	FFRDC	Georgia Tech Research Institute : Atlanta, GA	1.923	1.959	Dec 2019	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Consumables - Intermediate Range Ballistic Missiles (IRBM) - 17	MIPR	Space and Missile Systems Center : Albuquerque, NM	1.881	0.000		0.000		0.000		-		0.000	0.000	1.881	0.000
Consumables - Intermediate Range Ballistic Missiles (IRBM) - 18	MIPR	Naval Surface Warfare Center : Crane, IN	0.003	0.000		0.000		0.000		-		0.000	0.000	0.003	0.000
Consumables - Intermediate Range	MIPR	L3 Communications/ Coleman	4.406	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MT05 / *BMDS Targets Program*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ballistic Missiles (IRBM) - 19		Aerospace : Orlando, FL													
Consumables - Intermediate Range Ballistic Missiles (IRBM) - 20	MIPR	Redstone Arsenal Garrison : Huntsville, AL	0.160	0.000		0.000		0.000		-		0.000	0.000	0.160	0.000
Consumables - Intermediate Range Ballistic Missiles (IRBM) - 21	MIPR	United States Army Sustainment Command : Rock Island Arsenal, IL	0.002	0.000		0.000		0.000		-		0.000	0.000	0.002	0.000
Consumables - Intermediate Range Ballistic Missiles (IRBM) - 4	C/CPAF	Lockheed Martin Space Systems Company : Huntsville, AL	71.295	2.300	Nov 2019	5.579	Nov 2020	3.218	Nov 2021	-		3.218	Continuing	Continuing	Continuing
Consumables - Intercontinental Ballistic Missiles (ICBM) - 1	C/CPAF	Northrop Grumman Space Systems : Chandler, AZ	272.056	41.314	Nov 2019	38.273	Nov 2020	11.539	Nov 2021	-		11.539	Continuing	Continuing	Continuing
Consumables - Intercontinental Ballistic Missiles (ICBM) - 10	C/CPAF	Lockheed Martin Space Systems Company : Huntsville, AL	22.376	13.145	Nov 2019	0.000		7.583	Nov 2021	-		7.583	Continuing	Continuing	Continuing
Consumables - Intercontinental Ballistic Missiles (ICBM) - 14	MIPR	Air Force Research Laboratory : Wright Patterson AFB, OH	0.330	0.000		0.000		0.000		-		0.000	0.000	0.330	0.000
Consumables - Intercontinental Ballistic Missiles (ICBM) - 15	FFRDC	MIT Lincoln Laboratory : Hanscom AFB, Lexington, MA	20.483	0.000		0.000		0.000		-		0.000	0.000	20.483	0.000
Consumables - Intercontinental Ballistic Missiles (ICBM) - 16	C/CPAF	Northrop Grumman Space Systems : Magna, UT	4.978	0.000		5.126	Nov 2020	5.307	Nov 2021	-		5.307	Continuing	Continuing	Continuing
Consumables - Intercontinental Ballistic Missiles (ICBM) - 17	MIPR	Georgia Tech Applied Research : Atlanta, GA	5.595	4.406	Dec 2019	0.000		0.000		-		0.000	0.000	10.001	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MT05 / *BMDS Targets Program*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Consumables - Intercontinental Ballistic Missiles (ICBM) - 18	MIPR	Naval Surface Warfare Center : Indian Head, MD	0.393	0.000		0.000		0.000		-		0.000	0.000	0.393	0.000
Consumables - Intercontinental Ballistic Missiles (ICBM) - 19	MIPR	Sandia National Lab : Albuquerque, NM	12.332	6.070	Dec 2019	0.000		9.127	Dec 2021	-		9.127	Continuing	Continuing	Continuing
Consumables - Intercontinental Ballistic Missiles (ICBM) - 20	C/CPFF	Venturi Aerospace : Huntsville, AL	0.116	0.000		0.000		0.000		-		0.000	0.000	0.116	0.000
Consumables - Intercontinental Ballistic Missiles (ICBM) - 4	MIPR	Naval Air Weapons Station : China Lake, CA	0.605	0.096	Nov 2019	0.085	Nov 2020	0.391	Nov 2021	-		0.391	Continuing	Continuing	Continuing
Consumables - Intercontinental Ballistic Missiles (ICBM) - 5	MIPR	Naval Surface Warfare Center, Dahlgren Division : Dahlgren, VA	0.071	0.084	Nov 2019	0.000		0.000		-		0.000	0.000	0.155	0.000
Consumables - Joint Emergent Operational Need Statement (JEON) - 1	C/CPAF	L3 Communications/ Coleman Aerospace : Orlando, FL	34.900	9.600	Nov 2019	0.000		0.000		-		0.000	0.000	44.500	0.000
Consumables - Joint Emergent Operational Need Statement (JEON) - 2	MIPR	White Sands Missile Range : White Sands, NM	0.000	0.000		0.181	Nov 2020	0.000		-		0.000	0.000	0.181	0.000
Consumables - Joint Emergent Operational Need Statement (JEON) - 3	MIPR	Naval Surface Warfare Division - Port Hueneme : Port Hueneme, CA	0.000	0.000		5.090	Nov 2020	0.000		-		0.000	0.000	5.090	0.000
Consumables - Joint Emergent Operational Need Statement (JEON) - 4	MIPR	Space and Missile Defense Command : Huntsville, AL	4.500	0.000		1.293	Nov 2020	0.000		-		0.000	0.000	5.793	0.000
Program Planning & Operations - Program	C/CPAF	Targets TEAMS Support : Huntsville, AL	275.386	32.476	Nov 2019	28.293	Oct 2020	20.080	Nov 2021	-		20.080	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MT05 / *BMDS Targets Program*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Planning and Operations - 1															
Program Planning & Operations - Program Planning and Operations - 10	Allot	Missile Defense Agency : Huntsville, AL	197.258	26.459	Nov 2019	29.674	Nov 2020	28.232	Nov 2021	-		28.232	Continuing	Continuing	Continuing
Program Planning & Operations - Program Planning and Operations - 12	C/FFP	Network Management Resources : Chantilly, VA	3.174	0.142	Nov 2019	0.146	Nov 2020	0.150	Nov 2021	-		0.150	Continuing	Continuing	Continuing
Program Planning & Operations - Program Planning and Operations - 13	MIPR	Naval Surface Warfare Center : Crane, IN	0.048	0.111	Nov 2019	0.000		0.000		-		0.000	0.000	0.159	0.000
Program Planning & Operations - Program Planning and Operations - 14	FFRDC	Mitre Corporation : Huntsville, AL	0.615	0.324	Dec 2019	0.347	Dec 2020	0.000		-		0.000	0.000	1.286	0.000
Program Planning & Operations - Program Planning and Operations - 6	FFRDC	Johns Hopkins University, Applied Physics Lab : Baltimore, MD	6.427	1.746	Dec 2019	2.085	Dec 2020	2.134	Dec 2021	-		2.134	Continuing	Continuing	Continuing
Program Planning & Operations - Program Planning and Operations - 7	MIPR	US Army Aviation & Missile Command : Huntsville, AL	5.760	0.272	Nov 2019	0.196	Nov 2020	0.402	Nov 2021	-		0.402	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 37	FFRDC	Aerospace Corporation : El Segundo, CA	6.550	2.243	Nov 2019	4.093	Nov 2020	4.300	Nov 2021	-		4.300	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 40	MIPR	Army Information Management Command : San Antonio, TX	0.081	0.000		0.334	Nov 2020	0.118	Nov 2021	-		0.118	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MT05 / *BMDS Targets Program*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Resources - Resources/ Logistics - 41	MIPR	Marshall Space Flight Center : Huntsville, AL	0.034	0.011	Dec 2019	0.021	Dec 2020	0.000		-		0.000	0.000	0.066	0.000
Resources - Resources/ Logistics - 42	MIPR	Dugway Proving Ground : Dugway, UT	0.038	0.013	Dec 2019	0.028	Dec 2020	0.026	Dec 2021	-		0.026	Continuing	Continuing	Continuing
Resources - Resources - 1	C/CPAF	Targets Resources TEAMS Support : Huntsville, AL	0.000	9.281	Nov 2019	13.778	Oct 2020	13.160	Nov 2021	-		13.160	Continuing	Continuing	Continuing
Resources - Resources - 2	C/CPAF	L3 Communications/ Coleman Aerospace : Orlando, FL	0.000	21.979	Nov 2019	0.000		0.000		-		0.000	0.000	21.979	0.000
Resources - Resources - TBD	TBD	Future ILS/Systems Engineering Support : TBD	0.000	0.000		0.000		1.340	Dec 2021	-		1.340	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 1	C/CPAF	Lockheed Martin Space Systems Company : Huntsville, AL	48.253	0.227	Nov 2019	0.000		0.000		-		0.000	0.000	48.480	0.000
Resources - Resources/ Logistics - 12	MIPR	Redstone Arsenal Garrison : Huntsville, AL	3.410	0.014	Nov 2019	0.668	Nov 2020	0.893	Nov 2021	-		0.893	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 18	MIPR	Defense Finance & Accounting Service : Indianapolis, IN	3.361	0.148	Nov 2019	0.831	Nov 2020	0.543	Nov 2021	-		0.543	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 2	C/CPFF	Northrop Grumman Space Systems : Magna, UT	1.449	1.339	Nov 2019	0.000		0.000		-		0.000	0.000	2.788	0.000
Resources - Resources/ Logistics - 25	MIPR	Tooele Army Depot : Tooele, UT	1.605	0.650	Dec 2019	0.471	Dec 2020	0.063	Dec 2021	-		0.063	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 34	C/CPFF	Inuteq, Corp. : Beltsville, MD	3.046	1.032	Nov 2019	0.841	Nov 2020	0.000		-		0.000	0.000	4.919	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MT05 / *BMDS Targets Program*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Resources - Resources/ Logistics - 36	MIPR	Tobyhanna Army Depot : Tobyhanna, PA	4.204	0.988	Nov 2019	0.000		0.000		-		0.000	0.000	5.192	0.000
Resources - Resources/ Logistics - 43	MIPR	US Army Corps of Engineers : Huntsville, AL	0.000	0.000		0.008	Nov 2020	0.000		-		0.000	0.000	0.008	0.000
Resources - Resources/ Logistics - 44	C/CPAF	Jacobs Engineering Group : Huntsville, AL	0.000	0.000		0.140	Nov 2020	0.083	Nov 2021	-		0.083	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 45	MIPR	Redstone Test Center : Huntsville, AL	0.000	0.000		0.119	Nov 2020	0.000		-		0.000	0.000	0.119	0.000
Resources - Resources/ Logistics - 46	MIPR	Space and Missile Systems Center : Albuquerque, NM	0.100	0.000		5.833	Nov 2020	5.388	Nov 2021	-		5.388	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 47	MIPR	Space and Missile Defense Command : Huntsville, AL	0.066	0.000		0.000		0.000		-		0.000	0.000	0.066	0.000
Resources - Resources/ Logistics - 48	C/CPFF	Venturi Aerospace : Huntsville, AL	0.910	0.000		1.589	Jan 2021	1.154	Jan 2022	-		1.154	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 49	C/CPFF	Special Aerospace Services : Boulder, CO	0.295	0.000		0.000		0.783	Dec 2021	-		0.783	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 5	MIPR	Aviation & Missile Research, Dev & Eng Center : Huntsville, AL	9.453	0.381	Nov 2019	0.620	Nov 2020	0.250	Nov 2021	-		0.250	Continuing	Continuing	Continuing
Resources - Resources/ Logistics - 50	MIPR	Missile Defense Agency : Huntsville, AL	0.021	0.000		0.000		0.000		-		0.000	0.000	0.021	0.000
Resources - Resources/ Logistics - 7	Various	Missile Defense Agency : Huntsville, AL	8.720	0.194	Nov 2019	1.625	Nov 2020	0.000		-		0.000	0.000	10.539	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MT05 / *BMDS Targets Program*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Resources - Resources/ Systems Engineering - 1	C/CPAF	Lockheed Martin Space Systems Company : Huntsville, AL	111.563	0.000		0.000		0.000		-		0.000	0.000	111.563	0.000
Resources - Resources/ Systems Engineering - 14	MIPR	Naval Air Warfare Center : Point Mugu, CA	7.648	0.000		0.671	Nov 2020	0.606	Nov 2021	-		0.606	Continuing	Continuing	Continuing
Resources - Resources/ Systems Engineering - 17	MIPR	Defense Finance & Accounting Service : Indianapolis, IN	0.244	0.387	Nov 2019	0.000		0.000		-		0.000	0.000	0.631	0.000
Resources - Resources/ Systems Engineering - 18	MIPR	Redstone Arsenal Garrison : Huntsville, AL	0.655	0.035	Nov 2019	0.000		0.000		-		0.000	0.000	0.690	0.000
Resources - Resources/ Systems Engineering - 19	FFRDC	Sandia National Lab : Albuquerque, NM	10.678	0.000		5.215	Dec 2020	4.993	Dec 2021	-		4.993	Continuing	Continuing	Continuing
Resources - Resources/ Systems Engineering - 2	FFRDC	Aerospace Corporation : El Segundo, CA	26.262	4.969	Dec 2019	4.944	Dec 2020	4.486	Dec 2021	-		4.486	Continuing	Continuing	Continuing
Resources - Resources/ Systems Engineering - 20	MIPR	Space and Missile Defense Command : Huntsville, AL	0.720	0.000		0.000		0.000		-		0.000	0.000	0.720	0.000
Resources - Resources/ Systems Engineering - 21	C/CPAF	Draper Laboratory : Cambridge, MA	0.491	0.000		0.467	Nov 2020	0.000		-		0.000	0.000	0.958	0.000
Resources - Resources/ Systems Engineering - 22	Various	Missile Defense Agency : Huntsville, AL	0.000	0.000		0.000		0.500	Nov 2021	-		0.500	Continuing	Continuing	Continuing
Resources - Resources/ Systems Engineering - 3	MIPR	Arnold Engineering Development Complex : Arnold AFB, TN	0.000	0.000		0.000		3.608	Dec 2021	-		3.608	Continuing	Continuing	Continuing
Resources - Resources/ Systems Engineering - 6	FFRDC	Johns Hopkins University, Applied	6.976	2.123	Nov 2019	0.932	Nov 2020	0.844	Nov 2021	-		0.844	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MT05 / *BMDS Targets Program*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Physics Lab : Baltimore, MD													
Resources - Resources/ Systems Engineering - 8	MIPR	Aviation & Missile Research, Dev & Eng Center : Huntsville, AL	71.214	16.682	Nov 2019	9.404	Nov 2020	6.471	Nov 2021	-		6.471	Continuing	Continuing	Continuing
Flight Test Execution - 1	Various	Missile Defense Agency : Huntsville, AL	7.216	1.788	Oct 2019	8.535	Nov 2020	2.225	Dec 2021	-		2.225	0.000	19.764	0.000
Flight Test Execution - 10	MIPR	Hickam Field : Pearl Harbor, HI	0.410	0.052	Dec 2019	0.015	Dec 2020	0.026	Dec 2021	-		0.026	Continuing	Continuing	Continuing
Flight Test Execution - 11	MIPR	Redstone Army Airfield : Redstone Arsenal, AL	0.075	0.062	Dec 2019	0.111	Dec 2020	0.418	Dec 2021	-		0.418	Continuing	Continuing	Continuing
Flight Test Execution - 12	MIPR	Redstone Test Center : Huntsville, AL	0.238	0.075	Nov 2019	0.010	Nov 2020	0.020	Nov 2021	-		0.020	Continuing	Continuing	Continuing
Flight Test Execution - 13	C/CPAF	Northrop Grumman Space Systems : Chandler, AZ	14.410	2.988	Nov 2019	3.732	Nov 2020	5.054	Nov 2021	-		5.054	Continuing	Continuing	Continuing
Flight Test Execution - 14	MIPR	Naval Air Warfare Center : Pt. Mugu, CA	0.865	0.000		0.000		0.000		-		0.000	0.000	0.865	0.000
Flight Test Execution - 15	C/CPAF	Lockheed Martin Space Systems Company : Huntsville, AL	0.000	0.089	Dec 2019	0.000		0.000		-		0.000	0.000	0.089	0.000
Flight Test Execution - 17	MIPR	Columbus Air Force Base : Columbus, MS	0.000	0.025	Dec 2019	0.012	Dec 2020	0.000		-		0.000	0.000	0.037	0.000
Flight Test Execution - 18	MIPR	Naval Surface Warfare Center : Dahlgren, VA	0.332	0.197	Nov 2019	0.169	Nov 2020	0.315	Nov 2021	-		0.315	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / *Ballistic Missile Defense Targets*	Project (Number/Name) MT05 / *BMDS Targets Program*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Flight Test Execution - 19	MIPR	National Security Agency : Fort Meade, MD	0.181	0.068	Dec 2019	0.247	Dec 2020	0.245	Dec 2021	-		0.245	Continuing	Continuing	Continuing
Flight Test Execution - 2	MIPR	Defense Finance and Accounting Services : Indianapolis, IN	26.123	4.741	Nov 2019	4.100	Nov 2020	4.339	Nov 2021	-		4.339	Continuing	Continuing	Continuing
Flight Test Execution - 20	MIPR	Naval Surface Warfare Center : Port Hueneme, CA	2.168	1.747	Nov 2019	0.000		0.000		-		0.000	0.000	3.915	0.000
Flight Test Execution - 21	MIPR	Aviation and Missile Research Dev and Eng Center : Huntsville, AL	0.055	0.000		0.042	Nov 2020	0.046	Nov 2021	-		0.046	Continuing	Continuing	Continuing
Flight Test Execution - 22	MIPR	Andersen AFB : Guam	0.577	0.000		0.000		0.000		-		0.000	0.000	0.577	0.000
Flight Test Execution - 23	MIPR	Defense Logistics Agency : Fort Belvoir, VA	0.143	0.000		0.099	Nov 2020	0.262	Nov 2021	-		0.262	Continuing	Continuing	Continuing
Flight Test Execution - 24	MIPR	Kauai Test Facility : Kauai, HI	0.202	2.643	Nov 2019	0.000		0.000		-		0.000	0.000	2.845	0.000
Flight Test Execution - 25	MIPR	Space and Missile Defense Command : Huntsville, AL	4.133	0.000		0.000		0.000		-		0.000	0.000	4.133	0.000
Flight Test Execution - 26	C/CPAF	Northrop Grumman Space Systems : Magna, UT	0.703	0.000		0.000		0.000		-		0.000	0.000	0.703	0.000
Flight Test Execution - 28	MIPR	Space and Missile Systems Center : Albuquerque, NM	1.501	0.000		0.000		0.000		-		0.000	0.000	1.501	0.000
Flight Test Execution - 29	MIPR	Sandia National Lab : Albuquerque, NM	0.605	0.000		0.000		0.000		-		0.000	0.000	0.605	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MT05 / *BMDS Targets Program*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Flight Test Execution - 3	MIPR	Pacific Missile Range Facility : Barking Sands, HI	20.432	0.344	Nov 2019	0.000		0.000		-		0.000	0.000	20.776	0.000
Flight Test Execution - 31	C/CPAF	Targets Flight Test Execution TEAMS Support : Huntsville, AL	0.000	5.670	Nov 2019	6.757	Oct 2020	5.776	Nov 2021	-		5.776	Continuing	Continuing	Continuing
Flight Test Execution - 32	MIPR	Charleston Air Force Base : Joint Base Charleston, SC	0.000	0.000		0.000		0.013	Dec 2021	-		0.013	0.000	0.013	0.000
Flight Test Execution - 33	MIPR	Air Mobility Command : Joint Base LewisMcChord, WA	0.000	0.000		0.000		2.023	Dec 2021	-		2.023	Continuing	Continuing	Continuing
Flight Test Execution - 4	MIPR	Reagan Test Site : Kwajalein Atoll	9.838	2.763	Nov 2019	0.000		0.000		-		0.000	0.000	12.601	0.000
Flight Test Execution - 5	MIPR	Edwards Air Force Base : Lancaster, CA	16.280	3.109	Nov 2019	4.295	Nov 2020	7.094	Nov 2021	-		7.094	Continuing	Continuing	Continuing
Flight Test Execution - 6	MIPR	US Army Yuma Proving Ground : Yuma, AZ	1.702	1.593	Nov 2019	0.499	Nov 2020	1.790	Nov 2021	-		1.790	Continuing	Continuing	Continuing
Flight Test Execution - 7	MIPR	Eglin Air Force Base : Eglin AFB, FL	0.684	0.210	Nov 2019	0.113	Nov 2020	0.173	Nov 2021	-		0.173	Continuing	Continuing	Continuing
Flight Test Execution - 8	C/CPAF	L3 Communications/ Coleman Aerospace : Orlando, FL	8.293	1.448	Nov 2019	0.000		2.080	Nov 2021	-		2.080	0.000	11.821	0.000
Flight Test Execution - 9	MIPR	Air Force Research Laboratory : Wright Patterson AFB, OH	1.887	0.214	Dec 2019	0.587	Dec 2020	0.594	Dec 2021	-		0.594	Continuing	Continuing	Continuing
		Subtotal	3,287.778	529.029		513.139		532.690		-		532.690	Continuing	Continuing	N/A

Remarks

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / *Ballistic Missile Defense Targets*	Project (Number/Name) MT05 / *BMDS Targets Program*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	3,287.778	529.029		513.139		532.690		-		532.690	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may occur incrementally throughout the year.

Previous references to Orbital Sciences Corporation and Northrop Grumman Innovation Systems have been updated to Northrop Grumman Space Systems to reflect current corporate structure.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MT05 / *BMDS Targets Program*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
ICBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 3)				▲																								
MRBM Type 3/Configuration 2 Pre-Ship Readiness Review (Ship Set 5)					▲																							
MRBM T4-B Pre-Ship Readiness Review (Ship Set 24)						▲																						
MRBM T4-B Pre-Ship Readiness Review (Ship Set 25)						▲																						
SRBM Black Dagger Pre-Ship Readiness Review (Ship Set 1)						▲																						
SRBM PF Zombie Pre-Ship Readiness Review (Ship Set 1)							▲																					
SRBM T4-G Pre-Ship Readiness Review (Ship Set 1)							△																					
SRBM T4-G Pre-Ship Readiness Review (Ship Set 2)							△																					
MRBM Type 1/Type2 Pre-Ship Readiness Review (Ship Set 2)										△																		
IRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 10)											△																	

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MT05 / *BMDS Targets Program*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
ICBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 3)	4	2020	4	2020
MRBM Type 3/Configuration 2 Pre-Ship Readiness Review (Ship Set 5)	1	2021	1	2021
MRBM T4-B Pre-Ship Readiness Review (Ship Set 24)	2	2021	2	2021
MRBM T4-B Pre-Ship Readiness Review (Ship Set 25)	2	2021	2	2021
SRBM Black Dagger Pre-Ship Readiness Review (Ship Set 1)	2	2021	2	2021
SRBM PF Zombie Pre-Ship Readiness Review (Ship Set 1)	3	2021	3	2021
SRBM T4-G Pre-Ship Readiness Review (Ship Set 1)	3	2021	3	2021
SRBM T4-G Pre-Ship Readiness Review (Ship Set 2)	3	2021	3	2021
MRBM Type 1/Type2 Pre-Ship Readiness Review (Ship Set 2)	2	2022	2	2022
IRBM Type 1/Type 2 Pre-Ship Readiness Review (Ship Set 10)	3	2022	3	2022

Note

FY 2020 United States Indo-Pacific Command (USINDOPACOM) Joint Emerging Operational Needs (JEON) tests are funded in PE 0603914C BMD Test.
Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / *Ballistic Missile Defense Targets*	Project (Number/Name) MD40 / *Program Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program Wide Support*	135.001	15.845	21.296	19.160	-	19.160	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	15.845	21.296	19.160
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment,			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MD40 / *Program Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** - N/A			
Accomplishments/Planned Programs Subtotals	15.845	21.296	19.160

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MD40 / *Program Wide Support*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Operations Management	Various	Various; Multi : AL, CA, CO, VA	6.995	0.313	Jul 2020	0.000		0.000		-		0.000	0.000	7.308	0.000
Program Wide Support - Agency Operations and Support Civilian Salaries, Travel, Training	Various	MDA : Multi: AK, AL, CA, CO, VA	0.000	0.000		0.434	Nov 2020	0.264	Nov 2021	-		0.264	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Other Agency Services (FFP)	C/FFP	Mantech Security Mission Assurance Corporation : Multi: AL, CO, CA, VA	2.422	2.968	Dec 2019	6.906	Oct 2020	6.026	Dec 2021	-		6.026	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi:AL, CA, CO, VA	33.796	12.054	Jun 2020	12.985	May 2021	11.579	Nov 2021	-		11.579	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support, International, and Materiel and Readiness	MIPR	Various Multi: : AK, AL, CA, CO, HI, VA	0.623	0.510	Jul 2020	0.545	Oct 2020	0.708	Jan 2022	-		0.708	Continuing	Continuing	Continuing
Program Wide Support - FFRDC	FFRDC	Various : Multi: AL, VA	0.000	0.000		0.426	Aug 2021	0.583	Nov 2021	-		0.583	Continuing	Continuing	Continuing
Program Wide Support - Facilities and Maintenance SRM	MIPR	Various : Multi: AK, AL, CA, VA	27.517	0.000		0.000		0.000		-		0.000	0.000	27.517	0.000
Program Wide Support - Prior year no longer funded in the FYDP	Various	Various : Various	63.648	0.000		0.000		0.000		-		0.000	0.000	63.648	0.000
		Subtotal	135.001	15.845		21.296		19.160		-		19.160	Continuing	Continuing	N/A

Remarks

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603915C / *Ballistic Missile Defense Targets*	Project (Number/Name) MD40 / *Program Wide Support*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	135.001	15.845		21.296		19.160		-		19.160	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MD40 / *Program Wide Support*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603915C / *Ballistic Missile Defense Targets*	**Project (Number/Name)** MD40 / *Program Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

THIS PAGE INTENTIONALLY LEFT BLANK

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 0604102C / *Guam Defense Development*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	0.000	78.300	-	78.300	-	-	-	-	-	-
MD65: *Defense of Guam Development*	-	0.000	0.000	78.300	-	78.300	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

This PE is a new start. The increase from FY 2021 to FY 2022 provides the initiation of acquisition and research and development efforts for Defense of Guam.

A. Mission Description and Budget Item Justification

This program develops an integrated air and missile defense (IAMD) system on Guam against air-breathing, ballistic, and hypersonic missile threats. The defense of Guam is a high priority mission for the Department of Defense. An IAMD system will form a key part of deterring potential adversary aggression against Guam. A credible deterrent requires a broad strategy involving investments in passive defense measures, offensive capabilities, and other resilient approaches.

The Department is assessing alternatives for an IAMD architecture on Guam. While the final architecture designs and configuration are not yet finalized, there are common areas to the proposed architecture options which this funding is designed to jumpstart. The final architecture design will be determined based on the results of CAPE and MDA architecture studies. To avoid delays in delivering capability, MDA requests funding in FY22 to begin studies and analysis, architecture development and siting analysis that are common to all architectural proposals, to include integration efforts between Army and Navy systems.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	78.300	-	78.300
Total Adjustments	0.000	0.000	78.300	-	78.300
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	0.000	0.000	78.300	-	78.300

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0604102C *I Guam Defense Development*

Change Summary Explanation

Increase in FY 2022 provides the establishment of new Program Element (PE) 0604102C for the Defense of Guam to begin studies and analysis, architecture development and siting analysis that are common to all architectural proposals.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604102C / *Guam Defense Development*	Project (Number/Name) MD65 / *Defense of Guam Development*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD65: *Defense of Guam Development*	-	0.000	0.000	78.300	-	78.300	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This is a new start in FY 2022. The increase from FY 2021 to FY 2022 provides the initiation of acquisition and research and development efforts for Defense of Guam.

A. Mission Description and Budget Item Justification

MDA is developing options for an Integrated Air and Missile Defense (IAMD) System for Defense of Guam. The Department has undertaken studies on a range of missile defense architecture options, emphasizing effectiveness, survivability, and flexibility against an evolving threat. While the final architecture designs and configuration are not yet finalized, there are common areas to the proposed architecture options which this funding is designed to jumpstart. This funding will allow the Department to more rapidly field these capabilities.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Guam Defense System (GDS)	0.000	0.000	78.300
Articles:	-	-	-
Description: This program develops an integrated air and missile defense system on Guam against air-breathing, ballistic, and hypersonic missile threats, however, architecture designs are still being finalized. This funding initiates development of multiple architecture options by investing in key enabling capabilities common to all proposed architecture solutions. Such efforts include: - Joint Track Management Capabilities (JTMC) Bridge Development between the IAMD Battle Command System (IBCS), Aegis Weapon System (AWS), and the Command and Control, Battle Management, and Communications (C2BMC) system to promote greater integration between Army and Navy assets - Spectrum management studies for terminal defense radar - Acceleration of Sea-Based Terminal capabilities - Conduct systems engineering planning, architecture development, requirements analysis, configuration management functional flow down, specifications update, risk management, and trade studies - Update geographic specific threat models and scenarios, define test requirements, and update applicable specifications - Develop Concept of Operations and conduct Battle Management Design and Analysis - Perform Model Based Systems engineering, threat modeling, and Modeling and Simulation - Develop facilities requirements and design			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604102C / *Guam Defense Development*	**Project (Number/Name)** MD65 / *Defense of Guam Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Identify areas of consideration for the Defense of Guam site to include requirements definition, identify geographic locations that optimize operations, apply exclusionary and evaluative criteria, and location ranking - Initiation of Environmental Impact Assessment -Develop Acquisition and Contracting plans The final architecture design will be determined based on the results of CAPE and MDA architecture studies. These initial investments provide a baseline of capability to support a range of architecture options while allowing the Department to complete a robust discussion on the best architecture to pursue. ***FY 2021 Plans:*** N/A ***FY 2022 Plans:*** SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The increase from FY 2021 to FY 2022 provides the initiation of acquisition and research and development efforts for Defense of Guam.			
Accomplishments/Planned Programs Subtotals	0.000	0.000	78.300

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208902C: *MD65: Defense of Guam Procurement*	0.000	0.000	40.000	-	40.000	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

Acquisition strategy to be finalized after the Defense of Guam study is completed.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604102C / *Guam Defense Development*	**Project (Number/Name)** MD65 / *Defense of Guam Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Guam Defense System (GDS) - Guam Defense System	Various	Various : Various	0.000	0.000		0.000		78.300	Oct 2021	-		78.300	0.000	78.300	0.000
		Subtotal	0.000	0.000		0.000		78.300		-		78.300	0.000	78.300	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		78.300		-		78.300	0.000	78.300	N/A

Remarks

N/A

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604102C / *Guam Defense Development*	**Project (Number/Name)** MD65 / *Defense of Guam Development*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
GDS Development									✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604102C / *Guam Defense Development*	**Project (Number/Name)** MD65 / *Defense of Guam Development*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
GDS Development	1	2022	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

THIS PAGE INTENTIONALLY LEFT BLANK

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 0604115C / *Technology Maturation Initiatives*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	540.094	259.465	107.389	0.000	-	0.000	-	-	-	-	-	-
MD98: *Directed Energy Demonstrator Development*	316.345	108.685	42.000	0.000	-	0.000	-	-	-	-	-	-
MD99: *Discrimination Sensor Demonstrator Development*	183.443	135.993	62.237	0.000	-	0.000	-	-	-	-	-	-
MC98: *Cyber Operations*	6.063	0.463	0.475	0.000	-	0.000	-	-	-	-	-	-
MT99: *Technology Maturation Initiatives Test*	12.394	5.056	0.000	0.000	-	0.000	-	-	-	-	-	-
MD40: *Program Wide Support*	21.849	9.268	2.677	0.000	-	0.000	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

Due to a shift in Department of Defense priorities, the development of the Technology Maturation Initiatives Program has been cancelled beginning in FY 2022. The decrease from FY 2021 to FY 2022 reflects this change.

A. Mission Description and Budget Item Justification

Technology Maturation Initiatives (TMI) demonstrates the utility of directed energy for missile defense. The Missile Defense Agency's (MDA) directed energy plan incrementally demonstrates and improves the constituent components required to execute a directed energy kill chain; acquisition, tracking, and lethality. The efforts shape future Missile Defense System (MDS) acquisition choices by advancing the technology readiness levels of emerging and developing technologies, while simultaneously assessing the performance and contributions to the MDS architecture. TMI includes analysis, development, demonstration, systems engineering and test efforts to examine, develop, and improve directed energy systems, disruptive directed energy concepts, sensors, and future missile defense technologies.

Directed Energy Demonstrator Development (DEDD) addressed technology risk reduction and maturation for high powered strategic lasers, beam control, lethality, and related technologies. The efforts remain tightly coupled with OUSD(R&E) High Energy Laser Development Road Map, and are essential to mature strategic laser technology.

Discrimination Sensor Demonstrator Development (DSDD) included the development of an advanced sensor to discriminate lethal objects and integration of resulting technologies onto other MDS platforms in the future. The advanced sensor incorporates incrementally developed, integrated, and tested next-generation sensors and electronics to demonstrate Launch-on-Remote, Engage-on-Remote, discrimination and handover improvements for missile defense. These advanced sensors improve the probability of engagement success for stressing threats, expand the MDS battle space and increase the ability to negate larger raid sizes. The sensor technologies

also help develop the associated concept of operations and provide the basis for a quick reaction precision tracking capability to augment radar. MDA may use the sensor technology to address emerging advanced threats.

MDA collaborates with the Combatant Commands, Defense Advanced Research Projects Agency, Department of Energy, Joint Directed Energy Transition Office, Military Departments, National Laboratories and OUSD(R&E) in a systems engineering based strategy to research, analyze, develop and test directed energy weapons technology.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	264.520	67.389	73.214	-	73.214
Current President's Budget	259.465	107.389	0.000	-	0.000
Total Adjustments	-5.055	40.000	-73.214	-	-73.214
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	42.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-6.383	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	1.328	-2.000	-73.214	-	-73.214

Change Summary Explanation

FY 2020 does not include the enacted rescission of $6.4 million for Technology Maturation Initiatives.

Increase in FY 2021 provides $42 million Congressional increase for Diode Pumped Alkali Laser (DPAL).

Decrease in FY 2022 reflects a shift in Department of Defense priorities, cancelling the development of the Technology Maturation Initiatives Program beginning in FY 2022.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / *Technology Maturation Initiatives*	Project (Number/Name) MD98 / *Directed Energy Demonstrator Development*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD98: *Directed Energy Demonstrator Development*	316.345	108.685	42.000	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Due to a shift in Department of Defense priorities, the Directed Energy Demonstrator Development program was cancelled in FY 2021. The program received a Congressional add in FY 2021 to continue the Diode Pumped Alkali Laser program. No funding is requested for this effort in FY 2022. The decrease from FY 2021 to FY 2022 reflects this change. FY 2020 does not include the enacted rescission for Technology Maturation Initiatives.

A. Mission Description and Budget Item Justification

The Directed Energy Demonstrator Development (DEDD) project develops, integrates, and tests the component technologies required to scale electric lasers to hundreds of kilowatts. Laser scaling focuses on maturing laser capability to levels sufficient to enter into the OUSD(R&E) High Energy Laser Road Map efforts. The DEDD project provides the necessary technology, test data, and operations familiarity to successfully transition to a higher power directed energy weapon.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Directed Energy Demonstrator Development	108.685	42.000	0.000
Articles:	-	-	-
Description: Laser scaling develops, integrates, and tests the component technologies required for scaling electric lasers while maintaining excellent size, weight, and power metrics and near diffraction limited beam quality. MDA maintains partnerships with OUSD(R&E), Industry, and National Laboratories to focus on directed energy capabilities. The DEDD effort transitions from TMI onto OUSD(R&E) High Energy Laser Road Map in FY 2022.			
Specific and/or unique planned accomplishments to each FY are as follows:			
FY 2021 Plans: - Continue National Laboratory Diode Pump Alkali laser (DPAL) development towards scalable, efficient, and compact high-energy laser components - Build and test DPAL 60 kW-Class Beta 2			
FY 2022 Plans: - No funding is requested in FY 2022 for this effort			
FY 2021 to FY 2022 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604115C / *Technology Maturation Initiatives*	**Project (Number/Name)** MD98 / *Directed Energy Demonstrator Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
FY 2021 provides Congressional increase to continue Diode Pumped Alkali Laser (DPAL) development activities and PMO oversight into FY 2022. Due to a shift in Department of Defense priorities, the development of the Technology Maturation Initiatives program has been cancelled beginning in FY 2022. The decrease from FY 2021 to FY 2022 reflects this change. FY 2020 does not include the enacted rescission for Technology Maturation Initiatives.			
Accomplishments/Planned Programs Subtotals	108.685	42.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0604181C: *Hypersonic Defense*	386.528	272.632	247.931	-	247.931	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604115C / *Technology Maturation Initiatives*	**Project (Number/Name)** MD98 / *Directed Energy Demonstrator Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Directed Energy Demonstrator Development - Beam Control and Lethality Demonstration	C/CPFF	Multi : Multi	0.000	27.561	Jun 2020	0.000		0.000		-		0.000	0.000	27.561	0.000
Directed Energy Demonstrator Development - Industry Laser Scaling and Technology Transfer	C/CPFF	Boeing : CA	0.000	18.412	Dec 2019	0.000		0.000		-		0.000	0.000	18.412	0.000
Directed Energy Demonstrator Development - LPLD Preliminary Design A	C/CPFF	Lockheed Martin : CA	40.494	0.000		0.000		0.000		-		0.000	0.000	40.494	0.000
Directed Energy Demonstrator Development - LPLD Preliminary Design B	C/CPFF	General Atomics : CA	36.841	0.000		0.000		0.000		-		0.000	0.000	36.841	0.000
Directed Energy Demonstrator Development - LPLD Preliminary Design C	C/CPFF	Boeing : CA	36.361	0.000		0.000		0.000		-		0.000	0.000	36.361	0.000
Directed Energy Demonstrator Development - LPLD System Critical Design A (CPU)	C/CPFF	Lockheed Martin : CA	26.000	0.000		0.000		0.000		-		0.000	0.000	26.000	0.000
Directed Energy Demonstrator Development - LPLD System Critical Design B (CPU)	C/CPFF	General Atomics : CA	26.000	0.000		0.000		0.000		-		0.000	0.000	26.000	0.000
Directed Energy Demonstrator Development - LPLD	C/CPFF	Boeing : CA	26.000	0.000		0.000		0.000		-		0.000	0.000	26.000	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604115C / *Technology Maturation Initiatives*	**Project (Number/Name)** MD98 / *Directed Energy Demonstrator Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Critical Design C (CPU)															
Directed Energy Demonstrator Development - Laser Lethality Demonstration	C/CPFF	General Atomics, AFRL, Redstone Testing Center, White Sands Missile Range : CA, AL, NM	4.178	0.000		0.000		0.000		-		0.000	0.000	4.178	0.000
Directed Energy Demonstrator Development - Laser Scaling	C/Various	MIT LL, LLNL : MA, CA	85.000	51.658	Oct 2019	0.000		0.000		-		0.000	0.000	136.658	0.000
Directed Energy Demonstrator Development - Laser Scaling - Diode Pumped Alkali Laser (CPU)	Various	Multi, LLNL : Multi, CA	0.000	0.000		41.400	Mar 2021	0.000		-		0.000	0.000	41.400	0.000
Directed Energy Demonstrator Development - Performance Analysis	Various	MIT LL, Aviation and Missile Research Development and Engineering Center (AMRDEC),Combat Capabilities Development Command - Aviation and Missile Center (CCDC-AMC), AFRL, USAFA, Semquest : MA, AL, NM, CO	5.367	7.102	Jan 2020	0.000		0.000		-		0.000	0.000	12.469	0.000
Directed Energy Demonstrator Development - Technology Transfer/Component Development	C/CPIF	Boeing : CA	16.209	0.000		0.000		0.000		-		0.000	0.000	16.209	0.000
		Subtotal	302.450	104.733		41.400		0.000		-		0.000	0.000	448.583	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604115C / *Technology Maturation Initiatives*	**Project (Number/Name)** MD98 / *Directed Energy Demonstrator Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Directed Energy Demonstrator Development - Advisory and Assistance Services	C/CPFF	MDA Multi : AL, NM	7.413	0.000		0.600	Aug 2021	0.000		-		0.000	0.000	8.013	0.000
Directed Energy Demonstrator Development - Engineering and Technical Services	MIPR	Aviation and Missile Research Development and Engineering Center (AMRDEC), Combat Capabilities Development Command - Aviation and Missile Center (CCDC-AMC) : AL	2.221	0.000		0.000		0.000		-		0.000	0.000	2.221	0.000
Directed Energy Demonstrator Development - FFRDC	MIPR	Aerospace : AL, NM	1.450	1.867	Nov 2019	0.000		0.000		-		0.000	0.000	3.317	0.000
Directed Energy Demonstrator Development - Facility Support	Various	377th ABW, Phoenix : NM	0.268	0.215	Nov 2019	0.000		0.000		-		0.000	0.000	0.483	0.000
Directed Energy Demonstrator Development - Facility Sustainment	C/CPFF	Multi : AL, NM	0.548	0.733	Jul 2020	0.000		0.000		-		0.000	0.000	1.281	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / *Technology Maturation Initiatives*	Project (Number/Name) MD98 / *Directed Energy Demonstrator Development*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Directed Energy Demonstrator Development - Information Technology	C/CPFF	Northrop Grumman, Jacobs Technology : CO	1.995	0.987	Nov 2019	0.000		0.000		-		0.000	0.000	2.982	0.000
Directed Energy Demonstrator Development - Travel	Allot	MDA Multi : AL, NM	0.000	0.150	Oct 2019	0.000		0.000		-		0.000	0.000	0.150	0.000
		Subtotal	13.895	3.952		0.600		0.000		-		0.000	0.000	18.447	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	316.345	108.685		42.000		0.000		-		0.000	0.000	467.030	N/A

Remarks

N/A

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604115C / *Technology Maturation Initiatives*	**Project (Number/Name)** MD98 / *Directed Energy Demonstrator Development*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
Laser Scaling Development - Fiber Combined Laser (FCL)	✦	✦	✦	✦	✦																							
Laser Scaling Development - FCL						✧	✧	✧																				
Laser Scaling FCL Beam Quality and Power Demonstration								△																				
Laser Scaling Development - Diode Pumped Alkali Laser (DPAL)	✦	✦	✦	✦	✦																							
Laser Scaling Development - DPAL						✧	✧	✧	✧	✧	✧																	
Laser Scaling Development – DPAL 60 kW-Class Lab Demo								✧																				
Laser Scaling Development – DPAL 60 kW-Class Lab Demo with Beam Quality measurement										✧																		
Industry Laser Scaling Technology Design Review - Phase I (LM and GA)		▲																										
Industry Laser Scaling Technology Design Review - Phase II (LM)					▲																							

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604115C / *Technology Maturation Initiatives*	**Project (Number/Name)** MD98 / *Directed Energy Demonstrator Development*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Laser Scaling Development - Fiber Combined Laser (FCL)	1	2020	1	2021
Laser Scaling Development - FCL	2	2021	4	2021
Laser Scaling FCL Beam Quality and Power Demonstration	4	2021	4	2021
Laser Scaling Development - Diode Pumped Alkali Laser (DPAL)	1	2020	1	2021
Laser Scaling Development - DPAL	2	2021	3	2022
Laser Scaling Development DPAL 60 kW-Class Lab Demo	4	2021	4	2021
Laser Scaling Development DPAL 60 kW-Class Lab Demo with Beam Quality measurement	2	2022	2	2022
Industry Laser Scaling Technology Design Review - Phase I (LM and GA)	2	2020	2	2020
Industry Laser Scaling Technology Design Review - Phase II (LM)	1	2021	1	2021

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / *Technology Maturation Initiatives*	Project (Number/Name) MD99 / *Discrimination Sensor Demonstrator Development*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD99: *Discrimination Sensor Demonstrator Development*	183.443	135.993	62.237	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Due to a shift in Department of Defense priorities, the development of the Technology Maturation Initiatives Program has been cancelled beginning in FY 2022. The decrease from FY 2021 to FY 2022 reflects this change.

A. Mission Description and Budget Item Justification

Areas of concentration include tracking lasers, advanced detectors, infrared sensors, and precision tracking and discrimination algorithms. Discrimination Sensor Demonstrator Development (DSDD) demonstrates precision track of advanced threats at extended ranges, simple scene discrimination through ground demonstrations, and complex scene discrimination through flight and space demonstrations.

Develops and tests high-precision advanced sensors that improve incoming threat identification, acquisition, tracking, and discrimination. DSDD activities and software maturation enhances the MDS capability to discriminate lethal objects in a threat cluster, and track and hand over the threat object with Aegis Launch on Remote and Engage on Remote precision. The increased kinematics envelope of the SM-3 Block IIA, when combined with Engage on Remote capability, will expand battlespace and increase the number of threats engaged.

This effort includes the development of next-generation General Atomics' advanced sensor systems to include tracking lasers, specialized detectors, unique processors and the corollary ground, airborne and space subsystems. These advanced sensors operate at strategic ranges required to augment the MDS radar, improve the MDS discrimination capability and provide precision track of large raids. Potential development includes tracking multiple targets simultaneously, substantially reducing the number of sensor assets required for large raids.

The program leverages technology demonstrated from the ground and air to develop Massachusetts Institute of Technology/Lincoln Laboratory's (MIT/LL) compact ruggedized advanced sensor technology. This effort includes cost-effective focal plane arrays and advanced sensor components to inform future MDS layer decisions for persistent tracking and discrimination. MIT/LL develops and tests sensors to advance technology and assesses system performance from the ground.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Discrimination Sensor Demonstrator Development	135.993	47.239	0.000
Articles:	-	-	-
Description: Discrimination Sensor Demonstrator Development (DSDD) project develops an advanced sensor technology demonstration system (tracking laser, advanced detector, infrared sensor, and precision tracking and discrimination algorithms)			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604115C / *Technology Maturation Initiatives*	**Project (Number/Name)** MD99 / *Discrimination Sensor Demonstrator Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
for data collection and characterization relevant conditions and relevant ranges. The sensors upgrade will provide capability for tracking and discrimination of lethal objects. In addition, it provides passive stereo tracking and discrimination algorithms for the same. The sensors provide capability for tracking and discrimination of missile representative objects. Specific and/or unique planned accomplishments for each FY are as follows: ***FY 2021 Plans:*** - Integrate advanced sensor into a Size, Weight and Power (SWaP) confined design - Integrate ruggedized advanced sensor into SWaP constrained design - Conduct continental United States (CONUS) advanced sensor active ground test with new beam director - Continue fabrication and testing of ruggedized advanced sensor subsystems - Conduct CONUS ruggedized advanced sensor active ground test ***FY 2022 Plans:*** - No funding is requested in FY 2022 for this effort ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Due to a shift in Department of Defense priorities, the development of the Technology Maturation Initiatives Program has been cancelled beginning in FY 2022. The decrease from FY 2021 to FY 2022 reflects this change.			
Title: Program Operations	0.000	14.998	0.000
Articles:	-	-	-
Description: Program Operations provides strategic planning, program integration, acquisition, contracting, engineering, financial management, internal reviews and audits, and program assessments for the Technology Maturation Initiatives Program. Recurring activities include: - Provide technical and business management support activities to deliver critical program status and decision quality data - Ensure program compliance with internal and external direction, policies, and regulations to deliver critical capability within a consistent and disciplined process - Conduct internal program reviews to measure program progress - Continue a mission assurance and engineering program to include quality, configuration management, manufacturing, systems engineering, and safety in all phases of the system life cycle - Provide Quality Safety and Mission Assurance operations to ensure compliance with Agency requirements for design, test, manufacturing, quality, safety and reliability to ensure high quality products are delivered to the Warfighter ***FY 2021 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604115C / *Technology Maturation Initiatives*	**Project (Number/Name)** MD99 / *Discrimination Sensor Demonstrator Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- SEE ABOVE ***FY 2022 Plans:*** - No funding is requested in FY 2022 for this effort ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Due to a shift in Department of Defense priorities, the development of the Technology Maturation Initiatives Program has been cancelled beginning in FY 2022. The decrease from FY 2021 to FY 2022 reflects this change.			
Accomplishments/Planned Programs Subtotals	135.993	62.237	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603176C: *Advanced Concepts and Performance Assessment*	45.852	49.410	15.800	-	15.800	-	-	-	-	-	-
• 0603180C: *Advanced Research*	27.166	35.024	21.466	-	21.466	-	-	-	-	-	-
• 0603884C: *Ballistic Missile Defense Sensors*	348.356	265.803	224.750	-	224.750	-	-	-	-	-	-
• 0603890C: *BMD Enabling Programs*	630.196	616.455	595.301	-	595.301	-	-	-	-	-	-
• 0603896C: *Ballistic Missile Defense Command and Control, Battle Management & Communication*	550.513	645.741	603.448	-	603.448	-	-	-	-	-	-
• 1206895C: *Ballistic Missile Defense System Space Programs*	139.887	162.068	292.811	-	292.811	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The acquisition strategy for DSDD consists of a contract(s) to industry via the Advanced Technology Innovation Broad Agency Announcement and competitive procurements and agreements with Federally Funded Research and Development Centers to develop and demonstrate an advanced sensor system in realistic test environments. MDA will leverage agency partner subject matter experts and use government model based assessments for better acquisition decisions.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604115C / *Technology Maturation Initiatives*	**Project (Number/Name)** MD99 / *Discrimination Sensor Demonstrator Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Discrimination Sensor Demonstrator Development - Advanced Sensor - FFRDC	MIPR	Aerospace : CA	0.000	0.000		1.529	Nov 2020	0.000		-		0.000	0.000	1.529	0.000
Discrimination Sensor Demonstrator Development - Advanced Sensor Flight Demonstrator	Various	General Atomics, MIT/LL, TBD : CA, MA, TBD	53.654	55.383	Nov 2019	24.628	Nov 2020	0.000		-		0.000	0.000	133.665	0.000
Discrimination Sensor Demonstrator Development - Advanced Sensor Ground Test	MIPR	Navy China Lake : CA	32.483	1.139	Nov 2019	0.000		0.000		-		0.000	0.000	33.622	0.000
Discrimination Sensor Demonstrator Development - Advanced Sensor Performance Analysis Aegis Engage on Remote Hardware in the Loop (HWIL), and Analysis	MIPR	MIT LL, Aviation and Missile Research, Development, Engineering Center (AMRDEC), and Combat Capabilities Development Command - Aviation and Missile Center (CCDC-AMC), USAF : MA, AL, VA	16.014	7.956	Dec 2019	4.980	Dec 2020	0.000		-		0.000	0.000	28.950	0.000
Discrimination Sensor Demonstrator Development - Compact Ruggedized Advanced Sensor	Various	MIT LL, L3 : MA, NM	11.595	32.937	Jan 2020	16.102	Nov 2020	0.000		-		0.000	0.000	60.634	0.000
Discrimination Sensor Demonstrator Development - EO/IR Flight Tests	C/CPFF	General Atomics : CA	36.312	12.191	Nov 2019	0.000		0.000		-		0.000	0.000	48.503	0.000
		Subtotal	150.058	109.606		47.239		0.000		-		0.000	0.000	306.903	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604115C / *Technology Maturation Initiatives*	**Project (Number/Name)** MD99 / *Discrimination Sensor Demonstrator Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Discrimination Sensor Demonstrator Development - Advisory and Assistance Services	C/CPFF	Various : NM, AL	5.494	8.126	Nov 2019	0.000		0.000		-		0.000	0.000	13.620	0.000
Discrimination Sensor Demonstrator Development - Civilian Salaries and Travel	Allot	MDA Multi : AL, NM	12.502	14.116	Oct 2019	0.000		0.000		-		0.000	0.000	26.618	0.000
Discrimination Sensor Demonstrator Development - Engineering and Technical Services	MIPR	Aviation and Missile Research, Development, and Engineering Center (AMRDEC), Combat Capabilities Development Command - Aviation and Missile Center (CCDC-AMC), Aerospace : AL, CA	4.116	0.188	Oct 2019	0.000		0.000		-		0.000	0.000	4.304	0.000
Discrimination Sensor Demonstrator Development - Facility Support	MIPR	377th ABW : NM	0.311	0.000		0.000		0.000		-		0.000	0.000	0.311	0.000
Discrimination Sensor Demonstrator Development - Facility Sustainment	MIPR	377th ABW : NM	0.000	0.665	Nov 2019	0.000		0.000		-		0.000	0.000	0.665	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604115C / *Technology Maturation Initiatives*	**Project (Number/Name)** MD99 / *Discrimination Sensor Demonstrator Development*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Discrimination Sensor Demonstrator Development - Information Management and Technology	C/CPAF	Northrop Grumman, Jacobs Technology : CO	10.962	3.292	Oct 2019	0.000		0.000		-		0.000	0.000	14.254	0.000
Program Operations - Advisory and Assistance Services	C/CPFF	Various : NM, AL	0.000	0.000		4.920	Nov 2020	0.000		-		0.000	0.000	4.920	0.000
Program Operations - Civilian Salaries and Travel	Allot	MDA Multi : NM, AL	0.000	0.000		5.583	Nov 2020	0.000		-		0.000	0.000	5.583	0.000
Program Operations - Communications	MIPR	Various : NM, AL	0.000	0.000		0.626	Nov 2020	0.000		-		0.000	0.000	0.626	0.000
Program Operations - Facility Support	MIPR	377th ABW : NM	0.000	0.000		0.157	Nov 2020	0.000		-		0.000	0.000	0.157	0.000
Program Operations - Facility Sustainment (FSRM)	MIPR	377th ABW : NM	0.000	0.000		0.310	Oct 2020	0.000		-		0.000	0.000	0.310	0.000
Program Operations - Information Management and Technology	C/CPAF	Northrop Grumman, Jacobs Technology : CO	0.000	0.000		3.402	Oct 2020	0.000		-		0.000	0.000	3.402	0.000
		Subtotal	33.385	26.387		14.998		0.000		-		0.000	0.000	74.770	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	183.443	135.993		62.237		0.000		-		0.000	0.000	381.673	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604115C / *Technology Maturation Initiatives*	**Project (Number/Name)** MD99 / *Discrimination Sensor Demonstrator Development*

Significant Event Complete ▲ Significant Event Planned △ Milestone Decision Complete ★ Milestone Decision Planned ☆ Element Test Complete ◆ Element Test Planned ◇ System Level Test Complete ● System Level Test Planned ○ Complete Activity ✦ Planned Activity ✧

	FY 2020					FY 2021					FY 2022					FY 2023				FY 2024				FY 2025				FY 2026			
Advanced Sensor Development	✦	✦	✦	✦	✦																									
Planned Advanced Sensor Development						✧	✧	✧	✧	✧																				
Compact Ruggedized Advanced Sensor Development	✦	✦	✦	✦	✦																									
Planned Compact Ruggedized Advanced Sensor Development						✧	✧	✧	✧	✧																				

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604115C / *Technology Maturation Initiatives*	**Project (Number/Name)** MD99 / *Discrimination Sensor Demonstrator Development*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Advanced Sensor Development	1	2020	1	2021
Planned Advanced Sensor Development	2	2021	2	2022
Compact Ruggedized Advanced Sensor Development	1	2020	1	2021
Planned Compact Ruggedized Advanced Sensor Development	2	2021	2	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / *Technology Maturation Initiatives*	Project (Number/Name) MC98 / *Cyber Operations*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MC98: *Cyber Operations*	6.063	0.463	0.475	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2021 to FY 2022 reflects the cancellation of the Technology Maturation Initiatives Program.

A. Mission Description and Budget Item Justification

Cyber Operations sustains the Missile Defense Agency DoD Risk Management Framework (RMF) and Controls Validation Testing activities, analysis of validation results, risk assessments and reviews of proposed Program Manager/Information Assurance Manager Plans of Action and Milestones (POAM) for all Technology Maturation Initiative (TMI) mission systems. It maintains Certification and Accreditation data repository, capturing DoD Information Assurance Certification and Accreditation Program documentation (artifacts, validation results, and Information Assurance Risk Assessment results, and Designated Approving Authority accreditation decisions) and Plans of Action and Milestones on all MDA information systems.

This project monitors and tracks cybersecurity mitigations detailed in information technology security POAM. Activities include preparation of Certification and Accreditation documentation and accreditation recommendations to MDA Senior Information Assurance Officer /Certification Authority and Designated Approving Authority. Independent Verification and Validation team actions ensure the availability, integrity, authentication, confidentiality and non-repudiation of MDA mission, test and administrative systems. Activities in the project are necessary to comply with the Federal Information Security Management Act.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Network / System Certification and Accreditation (C&A)	0.463	0.475	0.000
Articles:	-	-	-
Description: The Cyber Operations project sustains MDA DoD RMF certification and Controls Validation Testing activities for the TMI PE.			
Specific and/or unique planned accomplishments to each FY are as follows:			
FY 2021 Plans: - Conduct cyber security and information assurance engineering and architecture planning for TMI information technology systems			
FY 2022 Plans: - No funding is requested in FY 2022 for this effort			
FY 2021 to FY 2022 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604115C / *Technology Maturation Initiatives*	**Project (Number/Name)** MC98 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Decrease from FY 2021 to FY 2022 reflects the cancellation of the Technology Maturation Initiatives Program			
Accomplishments/Planned Programs Subtotals	0.463	0.475	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603176C: *Advanced Concepts and Performance Assessment*	45.852	49.410	15.800	-	15.800	-	-	-	-	-	-
• 0603180C: *Advanced Research*	27.166	35.024	21.466	-	21.466	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The acquisition strategy for Cyber Operations, consists of using MDA civilian employees and the existing competitively awarded contractor support services.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / *Technology Maturation Initiatives*	Project (Number/Name) MC98 / *Cyber Operations*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Network / System Certification and Accreditation (C&A) - Cyber Development and Engineering	C/CPFF	Davidson Technologies, JHU, Raytheon : AL, MD, MA	5.000	0.000		0.000		0.000		-		0.000	0.000	5.000	0.000
Network / System Certification and Accreditation (C&A) - Cybersecurity Management and Computer Network Defense	C/CPFF	TEAMS : AL, NM	0.270	0.334	Oct 2019	0.315	Nov 2020	0.000		-		0.000	0.000	0.919	0.000
Network / System Certification and Accreditation (C&A) - Network / System Certification and Accreditation (C and A) - Agency Operations – Civilian Salaries and Travel	Allot	Missile Defense Agency : NM	0.462	0.129	Oct 2019	0.160	Nov 2020	0.000		-		0.000	0.000	0.751	0.000
Network / System Certification and Accreditation (C&A) - Network / System Certification and Accreditation (C and A) - CDS Implementation	C/CPFF	Northrop Grumman : CO	0.331	0.000		0.000		0.000		-		0.000	0.000	0.331	0.000
		Subtotal	6.063	0.463		0.475		0.000		-		0.000	0.000	7.001	N/A

Remarks

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / *Technology Maturation Initiatives*	Project (Number/Name) MC98 / *Cyber Operations*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	6.063	0.463		0.475		0.000		-		0.000	0.000	7.001	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604115C / *Technology Maturation Initiatives*	**Project (Number/Name)** MC98 / *Cyber Operations*

Significant Event Complete ▲ Significant Event Planned △ Milestone Decision Complete ★ Milestone Decision Planned ☆ Element Test Complete ◆ Element Test Planned ◇ System Level Test Complete ● System Level Test Planned ○ Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
Cyber Security Support	✦	✦	✦	✦	✦																							
Planned Cyber Security Support						✧	✧	✧																				

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604115C / *Technology Maturation Initiatives*	**Project (Number/Name)** MC98 / *Cyber Operations*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Cyber Security Support	1	2020	1	2021
Planned Cyber Security Support	2	2021	4	2021

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / *Technology Maturation Initiatives*	Project (Number/Name) MT99 / *Technology Maturation Initiatives Test*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MT99: *Technology Maturation Initiatives Test*	12.394	5.056	0.000	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY 2020 does not include the enacted rescission for Technology Maturation Initiatives. The remaining rescission funding is sourced from MD98.

A. Mission Description and Budget Item Justification

The TMI test project funds the management and execution of TMI system participation in MDS level tests, hardware-in-the-loop testing, and performance analysis costs for test data. This includes test asset shipment to test ranges, labor, travel, range support, Command & Control, Battle Management, Communications test support specific to TMI. No funding is requested for this project.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Technology Maturation Initiatives Test	5.056	0.000	0.000
Articles:	-	-	-
Description: The TMI Test project tests the systems developed under the DEDD and DSDD projects under realistic conditions in conjunction with on-going MDS testing and through dedicated live fire tests to inform continued testing, full development and limited fielding decisions. This effort also demonstrates potential sensors, systems, and architectures to integrate the MDS for left through right of launch. Specific and/or unique planned accomplishments to each FY are as follows: ***FY 2021 Plans:*** - No funding is requested in FY 2021 for this effort ***FY 2022 Plans:*** - No funding is requested in FY 2022 for this effort ***FY 2021 to FY 2022 Increase/Decrease Statement:*** FY 2020 does not include the enacted rescission for Technology Maturation Initiatives. The remaining rescission funding is sourced from MD98.			
Accomplishments/Planned Programs Subtotals	5.056	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604115C / *Technology Maturation Initiatives*	**Project (Number/Name)** MT99 / *Technology Maturation Initiatives Test*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604115C / *Technology Maturation Initiatives*	**Project (Number/Name)** MT99 / *Technology Maturation Initiatives Test*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technology Maturation Initiatives Test - Command Control Battle Management and Communications/Aegis	Various	Northrop Grumman, Lockheed Martin, Space and Naval Warfare Center, National Air and Space Intelligence Center, Naval Surface Warfare Center Dahlgren Division : CO, CA, OH, VA	5.068	0.000		0.000		0.000		-		0.000	0.000	5.068	0.000
Technology Maturation Initiatives Test - Range Facility Test Prep	MIPR	Pacific Missile Range Facility, Edwards AFB : HI, CA	0.437	0.000		0.000		0.000		-		0.000	0.000	0.437	0.000
Technology Maturation Initiatives Test - Sensor and Directed Energy Activity	Various	MDA : NM	0.000	5.056	Nov 2019	0.000		0.000		-		0.000	0.000	5.056	0.000
Technology Maturation Initiatives Test - Transportation Costs	MIPR	US Air Force : CA	6.889	0.000		0.000		0.000		-		0.000	0.000	6.889	0.000
		Subtotal	12.394	5.056		0.000		0.000		-		0.000	0.000	17.450	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	12.394	5.056		0.000		0.000		-		0.000	0.000	17.450	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604115C / *Technology Maturation Initiatives*	**Project (Number/Name)** MT99 / *Technology Maturation Initiatives Test*

Significant Event Complete ▲ Milestone Decision Complete ★ Element Test Complete ◆ System Level Test Complete ● Complete Activity ✦
Significant Event Planned △ Milestone Decision Planned ☆ Element Test Planned ◇ System Level Test Planned ○ Planned Activity ✧

	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
No Planned Activity due to Congressional Rescission		✧					

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604115C / *Technology Maturation Initiatives*	**Project (Number/Name)** MT99 / *Technology Maturation Initiatives Test*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
No Planned Activity due to Congressional Rescission	2	2021	2	2021

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604115C / *Technology Maturation Initiatives*	Project (Number/Name) MD40 / *Program Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program Wide Support*	21.849	9.268	2.677	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency PE's each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	9.268	2.677	0.000
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment,			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604115C / *Technology Maturation Initiatives*	**Project (Number/Name)** MD40 / *Program Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Due to a shift in Department of Defense priorities, the Department is cancelling the development of Technology Maturation Initiatives beginning in FY 2022. The decrease from FY 2021 to FY 2022 reflects this change.			
Accomplishments/Planned Programs Subtotals	9.268	2.677	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604115C / *Technology Maturation Initiatives*	**Project (Number/Name)** MD40 / *Program Wide Support*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Facilities and Maintenance	MIPR	Various : AL, CO, CA, VA	0.000	9.129	Nov 2019	1.262	Nov 2020	0.000		-		0.000	0.000	10.391	0.000
Program Wide Support - Agency Operations Management	MIPR	Various : Multi: AL, VA	0.225	0.139	Jul 2020	0.000		0.000		-		0.000	0.000	0.364	0.000
Program Wide Support - Agency Operations and Support Other Agency Services	MIPR	Various : Multi: AK, AL, CO, CA, HI, MD, VA	0.000	0.000		1.200	Nov 2020	0.000		-		0.000	0.000	1.200	0.000
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AK, AL, CA, CO, VA	21.624	0.000		0.000		0.000		-		0.000	0.000	21.624	0.000
Program Wide Support - Agency Operations, Sustainment and GPC	C/FFP	Various : Multi: AK, AL, CA, HI, NY, VA	0.000	0.000		0.215	Nov 2020	0.000		-		0.000	0.000	0.215	0.000
		Subtotal	21.849	9.268		2.677		0.000		-		0.000	0.000	33.794	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	21.849	9.268		2.677		0.000		-		0.000	0.000	33.794	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604115C / *Technology Maturation Initiatives*	**Project (Number/Name)** MD40 / *Program Wide Support*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧																				

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604115C / *Technology Maturation Initiatives*	**Project (Number/Name)** MD40 / *Program Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2021

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 0604181C / *Hypersonic Defense*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	195.644	386.528	272.632	247.931	-	247.931	-	-	-	-	-	-
MD29: *Hypersonic Defense*	190.254	379.830	262.549	239.151	-	239.151	-	-	-	-	-	-
MD40: *Program Wide Support*	5.390	6.698	10.083	8.780	-	8.780	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

FY 2021 Defense Appropriation included Congressional Plus Up (CPU) for Glide Phase Defeat Weapon System, Disruptive Technology for Future Architecture and Engineering Enablers. Decrease from FY 2021 to FY 2022 reflects the Congressional Plus Up in FY 2021.

A. Mission Description and Budget Item Justification

Potential adversaries are developing hypersonic missile capabilities that can travel at exceptional speeds with unpredictable flight paths that challenge existing defensive systems. These are challenging realities of the emerging missile threat environment that U.S. missile defense policy, strategy, and capabilities must address. These adversaries continue to expand the capability and capacity of their offensive hypersonic missile inventories, and both strategic and regional hypersonic missile capabilities. Research on hypersonic weapon technology and development of hypersonic weapons is proliferating to other countries.

In accordance with Public Law 114-328, the Director of the Missile Defense Agency shall serve as the executive agent for the Department of Defense for the development of a capability by the United States to counter hypersonic boost-glide vehicle capabilities and conventional prompt strike capabilities that may be employed against the United States, the allies of the United States, and the deployed forces of the United States. In carrying out as the executive agent, the Director shall develop architectures for a hypersonic defense capability, from detecting threats to intercepting such threats, that involves systems of the military departments and the Defense Agencies; and includes both kinetic and non-kinetic options for such interception; and establish a program of record to develop a hypersonic defense capability. MDA's Hypersonic Missile Defense (HMD) strategy includes leveraging existing systems, delivering an initial layered defense capability, and increasing defense capabilities in the future. Activities enabling this strategy are the following:

- Missile Defense System (MDS) architecture changes needed to address hypersonic threats include: persistent tracking of an unpredictable threat, improved communications, fire control strategy changes, and inclusion of new kinetic interceptor(s) with very high agility in a harsh aerothermal environment and/or non-kinetic solutions needed to negate hypersonic threats
- Maturing critical technologies and mitigating key technical risks including testing in relevant environments prior to selecting a final concept
- Partnering with the Services and other agencies to leverage work on common technologies, test infrastructure, weapon development, testing, and war-gaming
- Partnering with Allies where possible
- Demonstrating hypersonic defense capability and performance through system testing

This Hypersonic Defense (HD) Program Element (PE) includes executing the systems engineering activities, upgrading existing systems, investing in new technologies, developing new defensive capabilities and collecting hypersonic vehicle data in partner flight tests.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0604181C / *Hypersonic Defense*

This PE supports Pacific Deterrence Initiatives (PDI) by pursuing a glide phase interceptor capability to counter the peer threat in a regional denied environment.

Funding provides limited hypersonic missile defense content:
- Execute Systems Engineering for HD (architecture analysis, technology prioritization, requirements development, planning, analysis and capability development)
- Modify existing MDS Sensors and Command, Control, Battle Management, and Communications (C2BMC) for track and warning of hypersonic threats
- Develop Hypersonic Defense Weapon Systems and mature technology to enable a broad set of solutions including kinetic and non-kinetic means
- Develop advanced sensor and Command and Control (C2) technology to include ground, airborne, and space based technologies to inform the HD development strategy

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	390.204	206.832	107.521	-	107.521
Current President's Budget	386.528	272.632	247.931	-	247.931
Total Adjustments	-3.676	65.800	140.410	-	140.410
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	65.800			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-3.865	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	0.189	0.000	140.410	-	140.410

Change Summary Explanation

FY 2020 does not include the enacted rescission of $25.1 million for MDA hypersonic defense partner tests and $12.5 million for delays in the Glide Phase Defeat Weapon System.

FY 2021 Defense Appropriation included Congressional Plus Up (CPU) for Glide Phase Defeat Weapon System, Disruptive Technology for Future Architecture and Engineering Enablers.

Increase in FY 2022 provides acceleration of Aegis Glide Phase Intercept (GPI) capability and other hypersonic missile defense capabilities.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604181C / *Hypersonic Defense*	Project (Number/Name) MD29 / *Hypersonic Defense*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD29: *Hypersonic Defense*	190.254	379.830	262.549	239.151	-	239.151	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2021 to FY 2022 reflects the Congressional Plus Up in FY 2021.

A. Mission Description and Budget Item Justification

Potential adversaries are developing hypersonic missile capabilities that can travel at exceptional speeds with unpredictable flight paths that challenge existing defensive systems. These are challenging realities of the emerging missile threat environment that U.S. missile defense policy, strategy, and capabilities must address. These adversaries continue to expand the capability and capacity of their offensive hypersonic missile inventories, both strategic and regional hypersonic missile capabilities. Research on hypersonic weapon technology and development of hypersonic weapons is proliferating to other countries.

In accordance with Public Law 114-328, the Director of the Missile Defense Agency shall serve as the executive agent for the Department of Defense for the development of a capability by the United States to counter hypersonic boost-glide vehicle capabilities and conventional prompt strike capabilities that may be employed against the United States, the allies of the United States, and the deployed forces of the United States. In carrying out as the executive agent, the Director shall develop architectures for a hypersonic defense capability, from detecting threats to intercepting such threats, that involves systems of the military departments and the Defense Agencies; and includes both kinetic and non-kinetic options for such interception; and establish a program of record to develop a hypersonic defense capability. MDA's Hypersonic Missile Defense (HMD) strategy includes leveraging existing systems, delivering an initial layered defense capability, and increasing defense capabilities in the future. Activities enabling this strategy are the following:
- MDS architecture changes needed to address hypersonic threats include: persistent tracking of an unpredictable threat, improved communications, fire control strategy changes, and inclusion of new kinetic interceptor(s) with very high agility in a harsh aerothermal environment and/or non-kinetic solutions needed to negate hypersonic threats
- Maturing critical technologies and mitigating key technical risks including testing in relevant environments prior to selecting a final concept
- Partnering with the Services and other agencies to leverage work on common technologies, test infrastructure, weapon development, testing, and war-gaming
- Partnering with Allies where possible
- Demonstrating hypersonic defense capability and performance through system testing

This Hypersonic Defense (HD) Program Element (PE) includes executing the systems engineering activities, upgrading existing systems, investing in new technologies, developing new defensive capabilities and collecting hypersonic vehicle data in partner flight tests.

This PE supports Pacific Deterrence Initiatives (PDI) by pursuing a glide phase interceptor capability to counter the peer threat in a regional denied environment.

Funding provides limited hypersonic missile defense content:
- Execute Systems Engineering for HD (architecture analysis, technology prioritization, requirements development, planning, analysis and capability development)

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604181C / *Hypersonic Defense*	**Project (Number/Name)** MD29 / *Hypersonic Defense*

- Modify existing MDS Sensors and Command, Control, Battle Management, and Communications (C2BMC) for track and warning of hypersonic threats
- Develop Hypersonic Defense Weapon Systems and mature technology to enable a broad set of solutions including kinetic and non-kinetic means
- Develop advanced sensor and C2 technology to include ground, airborne, and space based technologies to inform the HD development strategy

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Hypersonic Defense	0.000	0.000	0.000
Articles:	-	-	-
Description: N/A ***FY 2021 Plans:*** N/A ***FY 2022 Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Disruptive Technologies for Future Architecture	38.523	54.052	16.565
Articles:	-	-	-
Description: Provides identification, development of new technology and capabilities needed across the kill chain in support of Hypersonic Missile Defense architecture alternatives, and the ability to address advanced threats. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - Provide development of Weapon and Sensor System Component Technologies: -- Initial Digital Focal Plane Array deliveries under the Hypersonic Threat and Sensor Technologies -- Advanced technology efforts to increase Digital Focal Plane Arrays dynamic range for improved sensitivity across a broader range of threats -- Develop low-cost/light weight Focal Plane Array sensor supporting electronics and cooling. -- Develop propulsion technology to increase maneuverability and energy management -- Develop advanced concepts to counter the evolving threats -- Perform advanced long term seeker windows and on-demand propulsion for axial/lateral divert activities ***FY 2022 Plans:*** - Continue to develop supporting low-cost/light weight Focal Plane Array sensor electronics for increased throughput and cryocoolers in an open architecture applicable to multiple sensor systems - Continue development of advanced technology concepts to counter the evolving threats			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604181C / *Hypersonic Defense*	**Project (Number/Name)** MD29 / *Hypersonic Defense*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Continue to develop propulsion technology to increase maneuverability and energy management for future endo-atmospheric hypersonic interceptor kill vehicles and rocket motors to include testing and demonstrations in relevant environments ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the FY 2021 Congressional Plus Up for advanced long term seeker windows and on-demand propulsion for axial/lateral divert activities.			
Title: Engineering Enablers	76.434	59.901	65.173
Articles:	-	-	-
Description: Provides systems engineering activities required to evolve the MDS to address hypersonic threats, to include architecture analysis, capability roadmap development, and requirements development. Recurring activities include: - Conduct foundational Systems Engineering activities required to develop Hypersonic Defense, including concept definition, requirements and interfaces, system design, integration, test planning, and use of digital engineering tools and practices -- Provide key products for development and maintenance of the technical baseline -- Assess current MDS capabilities against hypersonic threats and analyze future HD solutions to counter the evolving threat -- Develop and integrate modeling and simulation tools to validate HD requirements and assess HD performance -- Support HD reviews to coordinate the technical and program baselines to ensure development of a successful capability -- Continue to mature modeling and simulation architecture - Perform engineering analysis, develop requirements, and define interfaces for sensor-to-weapon fire control using C2BMC to lay the path for connectivity, battle management, and sensor tasking to a weapon system such as Aegis Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - Develop modeling and simulation for glide phase weapon lethality and conduct lethality testing - Perform Kinetic Kill Lethality Testing, M&S anchored in aero and aero optical test data and mid and long term hypersonic defense architecture analysis ***FY 2022 Plans:*** - Provide Truth and Threat Modeling to stimulate and enable integrated M&S federations (Ground Test and All-Digital in-line Truth Models and Threat Modeling) - Develop hypersonic threat models and update existing threat models based on real-world data to support analysis ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides systems engineering activities to accelerate the development of hypersonic missile defense capabilities and evolve to multi-domain missile defense that includes ballistic and hypersonic missile defense.			
Title: Leverage and Upgrade Existing Systems	94.653	21.212	21.559

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604181C / *Hypersonic Defense*	**Project (Number/Name)** MD29 / *Hypersonic Defense*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Articles:	-	-	-
Description: Analyze existing systems capability to defend against hypersonic threats and upgrade existing systems to support hypersonic missile defense activities. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - Complete JEON response for real time detection warning, tracking, and reporting of Hypersonic Glide Vehicles (HGV) via C2BMC for MDS situational awareness - Evaluate and support internal synchronization, technology insertion, and program requirements generation and validation - Continue to upgrade C2BMC and sensor cueing to provide C2BMC reporting of HGV tracks to MDS weapon systems ***FY 2022 Plans:*** - Upgrade C2BMC to support Aegis Glide Phase Intercept (GPI) capability - Continue C2BMC algorithm development and prototyping for advanced threat battle management to support weapon system engagement - Complete AN/TPY-2 test integration and track reporting threats with C2BMC using CX software version 5 (CX5), which will contribute to end-to-end missile defense system performance ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: Glide Phase Defeat Weapon System	66.141	127.384	135.854
Articles:	-	-	-
Description: This effort develops an operational defensive capability to engage and defeat regional hypersonic threats during the glide phase of flight using the proven Aegis Weapon System. This will provide an additional layer of hypersonic defense from an Aegis ship which also augments Sea-Based Terminal capability by extending the battlespace of early terminal. The operational defensive capability includes the development of a GPI missile that reduces the operational seam currently used by hypersonic threats to fly between air defense and ballistic missile defense systems. The effort also includes updates to the Aegis Weapon System and C2BMC for planning, tracking and conducting launch on remote engagements against hypersonic threats within the MDS as well as conducting studies and advancing hypersonic capability to legacy Aegis Weapon Systems. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** GPI Missile - Conduct GPI missile technical risk reduction activities and concept development/definition - Award multiple contractor efforts through preliminary design focusing on maturation of high risk areas to determine the executability of each concept's unique design characteristics			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604181C / *Hypersonic Defense*	**Project (Number/Name)** MD29 / *Hypersonic Defense*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Conduct initial technical reviews of GPI missile designs - Establish GPI draft requirements baseline and commence drafting Top-Level Specifications and Interface Control Documents - Conduct studies to explore and advance concepts in missile technology Aegis Weapon System - Continue analysis based on initial modeling to identify system design gaps and integration challenges needed to incorporate Glide Phase Weapon Control changes in the Aegis Weapon System - Continue Aegis Weapon System analysis to determine software design modifications - Award Aegis Weapon System Prime development contract - Continue modeling changes needed to incorporate GPI capability into the MDS - Establish Aegis Weapon System draft requirements baseline and commence drafting Element Specification and Interface Control Documents - Conduct reviews and activities for improving defense against hypersonic threats with the Aegis platform - Conduct studies to explore and advance concepts in weapon system technology			
FY 2022 Plans: GPI Missile - Continue GPI design analysis activities and requirements definition - Conduct Technology Readiness Level Assessments of contractor designs - Conduct GPI Missile System Requirement Reviews (SRR) for multiple vendor designs which ensures the system under review can proceed into initial systems development - Initiate preparations for multiple GPI missile Preliminary Design Reviews (PDR) which establishes the allocated baseline for the GPI capability to include Mk 41 Vertical Launch System integration and Aegis Launch on Remote engagement capability - Conduct studies to explore and advance concepts in missile technology - Design and procure material for Software Evaluation Station (SWES), Computer In The Loop (CIL) and Hardware In The Loop (HIL) Aegis Weapon System - Conduct Aegis Weapon System trade studies and concepts supporting Level A-Specification development - Continue modeling changes needed to incorporate Aegis Weapon System upgrades and Interceptor development - Initiate preparations for Aegis Weapon System (AWS) development Preliminary Design Reviews (PDR) which establishes the allocated baseline work associated with the GPI Interceptor to include Mission Planning capabilities -- Launch On Remote Engagement Capability -- C2 logic required for hypersonic vehicle glide phase engagements -- C2BMC algorithm development and prototyping for advanced threat battle management to support weapon system engagement			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604181C / *Hypersonic Defense*	**Project (Number/Name)** MD29 / *Hypersonic Defense*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-- Hypersonic glide phase engagement sequences -- Integration of AWS with new Hypersonic Glide Phase Interceptor -- Interoperability of AWS Regional Glide Phase capability with the MDS - Conduct reviews and activities for improving defense against hypersonic threats with the Aegis platform - Conduct studies to explore and advance concepts in weapon system technology ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides for additional requirements definition, assessments and studies in preparation for the missile and weapon system PDR.			
Title: Partnered Flight Test Participation	104.079	0.000	0.000
Articles:	-	-	-
Description: MDA's participation in Partner Flight Test events is critical for data collection across a diverse hypersonic threat set from multiple types of launch platforms. Participation in these test events supports the development and fielding of MDA's Hypersonic Defense capabilities to protect the United States, its allies, and deployed forces in all phases of flight. ***FY 2021 Plans:*** N/A ***FY 2022 Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	379.830	262.549	239.151

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603176C: *Advanced Concepts and Performance Assessment*	45.852	49.410	15.800	-	15.800	-	-	-	-	-	-
• 0603180C: *Advanced Research*	27.166	35.024	21.466	-	21.466	-	-	-	-	-	-
• 0603884C: *Ballistic Missile Defense Sensors*	348.356	265.803	224.750	-	224.750	-	-	-	-	-	-
• 0603890C: *BMD Enabling Programs*	630.196	616.455	595.301	-	595.301	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604181C / *Hypersonic Defense*	**Project (Number/Name)** MD29 / *Hypersonic Defense*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603892C: *AEGIS BMD*	722.582	877.336	732.512	-	732.512	-	-	-	-	-	-
• 0603896C: *Ballistic Missile Defense Command and Control, Battle Management & Communication*	550.513	645.741	603.448	-	603.448	-	-	-	-	-	-
• 0603915C: *Ballistic Missile Defense Targets*	545.764	536.133	553.334	-	553.334	-	-	-	-	-	-
• 1206895C: *Ballistic Missile Defense System Space Programs*	139.887	162.068	292.811	-	292.811	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

To optimize Missile Defense System performance, MDA leverages the nation's engineering centers of excellence at government agencies, Military Services, Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Centers (UARCs), and industry. The executing agents use varying contracting strategies in a flexible manner to maximize their contribution to the Missile Defense System. MDA acquires products and services by competitive means to the extent that is possible, practical and uses the Advanced Technology Broad Area Announcement process to award concept definition contracts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604181C / *Hypersonic Defense*	**Project (Number/Name)** MD29 / *Hypersonic Defense*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hypersonic Defense - Component Technology for Sensors and Weapons	MIPR	Various : AL	20.500	0.000		0.000		0.000		-		0.000	0.000	20.500	0.000
Hypersonic Defense - MDS C2BMC Upgrades	C/Various	Various : AL	33.645	0.000		0.000		0.000		-		0.000	0.000	33.645	0.000
Hypersonic Defense - MDS Sensor Upgrades - AN/TPY-2	SS/CPFF	Raytheon : MA	16.474	0.000		0.000		0.000		-		0.000	0.000	16.474	0.000
Hypersonic Defense - MDS Sensor Upgrades - LRDR	C/FFP	Lockheed Martin : NJ	12.007	0.000		0.000		0.000		-		0.000	0.000	12.007	0.000
Hypersonic Defense - Sensor Technology - Advanced Threat Tracking and Analysis / Low Latency Processing	MIPR	Various : AL, CA	13.016	0.000		0.000		0.000		-		0.000	0.000	13.016	0.000
Hypersonic Defense - Sensor Technology - Sensor Concept and Development	MIPR	Various : AL	21.522	0.000		0.000		0.000		-		0.000	0.000	21.522	0.000
Hypersonic Defense - Systems Engineering	Allot	MDA : AL, VA	5.444	0.000		0.000		0.000		-		0.000	0.000	5.444	0.000
Hypersonic Defense - Systems Engineering -- CSS	C/CPFF	TEAMS : AL, VA	6.688	0.000		0.000		0.000		-		0.000	0.000	6.688	0.000
Hypersonic Defense - Systems Engineering -- FFRDC/UARC	MIPR	Various : VA, AL	7.257	0.000		0.000		0.000		-		0.000	0.000	7.257	0.000
Hypersonic Defense - Systems Engineering -- Industry	C/CPAF	Boeing : AL	3.539	0.000		0.000		0.000		-		0.000	0.000	3.539	0.000
Hypersonic Defense - Technology Development Program Operations	Allot	MDA : AL, VA	11.861	0.000		0.000		0.000		-		0.000	0.000	11.861	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604181C / *Hypersonic Defense*	**Project (Number/Name)** MD29 / *Hypersonic Defense*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hypersonic Defense - Weapon Concept Definition & Risk Reduction	C/Various	Various : AL	38.301	0.000		0.000		0.000		-		0.000	0.000	38.301	0.000
Disruptive Technologies for Future Architecture - Hypersonic Defense - Component Technology for Sensors and Weapons	MIPR	Various : AL	0.000	16.104	Nov 2019	46.260	Dec 2020	11.794	Dec 2021	-		11.794	Continuing	Continuing	Continuing
Disruptive Technologies for Future Architecture - Hypersonic Defense - Sensor Technology - Advanced Threat Tracking and Analysis / Low Latency Processing	MIPR	Various : AL, CA	0.000	7.351	Nov 2019	0.000		0.000		-		0.000	0.000	7.351	0.000
Disruptive Technologies for Future Architecture - Hypersonic Defense - Sensor Technology / Sensor Concept and Development	MIPR	Various : AL	0.000	15.068	Nov 2019	7.792	Dec 2020	4.771	Dec 2021	-		4.771	Continuing	Continuing	Continuing
Engineering Enablers - Hypersonic Defense - Systems Engineering	Various	MDA : AL, VA	0.000	12.620	Nov 2019	19.360	Nov 2020	21.155	Nov 2021	-		21.155	Continuing	Continuing	Continuing
Engineering Enablers - Hypersonic Defense - Systems Engineering - Lethality and Analysis	Various	Various : TN, AL, NM, CA, TX	0.000	8.325	Feb 2020	8.407	Nov 2020	8.575	Nov 2021	-		8.575	Continuing	Continuing	Continuing
Engineering Enablers - Hypersonic Defense - Systems Engineering - M&S	C/CPAF	Northrop Grumman : AL	0.000	6.680	Feb 2020	5.423	Jan 2021	9.153	Dec 2021	-		9.153	0.000	21.256	0.000
Engineering Enablers - Hypersonic Defense -	Various	Various : AL	0.000	12.834	Feb 2020	2.009	Feb 2021	2.050	Dec 2021	-		2.050	0.000	16.893	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604181C / *Hypersonic Defense*	**Project (Number/Name)** MD29 / *Hypersonic Defense*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering - Threat Engineering															
Engineering Enablers - Hypersonic Defense - Systems Engineering -- CSS	C/CPFF	TEAMS : AL, VA	0.000	7.473	Nov 2019	3.462	Nov 2020	3.531	Nov 2021	-		3.531	Continuing	Continuing	Continuing
Engineering Enablers - Hypersonic Defense - Systems Engineering -- FFRDC/UARC	MIPR	Various : AL, VA	0.000	28.502	Nov 2019	21.240	Jan 2021	20.709	Dec 2021	-		20.709	Continuing	Continuing	Continuing
Leverage and Upgrade Existing Systems - Hypersonic Defense - C2BMC GPI	C/CPAF	SciTec : Newark, NJ	0.000	0.000		0.000		1.832	Nov 2021	-		1.832	Continuing	Continuing	Continuing
Leverage and Upgrade Existing Systems - Hypersonic Defense - C2BMC GPI (PRIME)	C/CPIF	Lockheed Martin : AL	0.000	0.000		0.000		7.926	Nov 2021	-		7.926	Continuing	Continuing	Continuing
Leverage and Upgrade Existing Systems - Hypersonic Defense - C2BMC GPI Prototype/ Development	C/CPAF	Northrop Grumman : CO	0.000	0.000		0.000		2.850	Nov 2021	-		2.850	Continuing	Continuing	Continuing
Leverage and Upgrade Existing Systems - Hypersonic Defense - MDS C2BMC	Various	Various : Various	0.000	28.092	Nov 2019	3.583	Jan 2021	1.121	Nov 2021	-		1.121	Continuing	Continuing	Continuing
Leverage and Upgrade Existing Systems - Hypersonic Defense - MDS C2BMC Upgrades (Prime)	C/CPIF	Lockheed Martin : AL	0.000	8.398	Jan 2020	9.777	Nov 2020	2.840	Nov 2021	-		2.840	Continuing	Continuing	Continuing
Leverage and Upgrade Existing Systems - Hypersonic Defense -	C/CPAF	Northrop Grumman : CO	0.000	23.181	Jan 2020	7.852	Nov 2020	4.000	Nov 2021	-		4.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604181C / *Hypersonic Defense*	Project (Number/Name) MD29 / *Hypersonic Defense*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MDS C2BMC Upgrades for HD															
Leverage and Upgrade Existing Systems - Hypersonic Defense - MDS Sensor Upgrades	C/FFP	Lockheed Martin : NJ	0.000	4.189	Nov 2019	0.000		0.000		-		0.000	0.000	4.189	0.000
Leverage and Upgrade Existing Systems - Hypersonic Defense - MDS Sensor Upgrades - AN/TPY-2	SS/CPFF	Raytheon : MA	0.000	30.793	Nov 2019	0.000		0.990	Nov 2021	-		0.990	0.000	31.783	0.000
Glide Phase Defeat Weapon System - Hypersonic Defense - D	Allot	MDA : AL, VA	0.000	3.866	Nov 2019	4.230	Nov 2020	0.000		-		0.000	0.000	8.096	0.000
Glide Phase Defeat Weapon System - Hypersonic Defense - Engineering Support	MIPR	NSWCD : VA	0.000	0.000		8.908	Nov 2020	13.525	Nov 2021	-		13.525	Continuing	Continuing	Continuing
Glide Phase Defeat Weapon System - Hypersonic Defense - Interface Change Proposals	MIPR	NIWC PAC : CA	0.000	0.000		2.111	Nov 2020	3.560	Nov 2021	-		3.560	Continuing	Continuing	Continuing
Glide Phase Defeat Weapon System - Hypersonic Defense - Special Studies	C/CPAF	APL : MD	0.000	0.000		6.049	Nov 2020	4.271	Nov 2021	-		4.271	Continuing	Continuing	Continuing
Glide Phase Defeat Weapon System - Hypersonic Defense - Systems Engineering	MIPR	MIT/LL : MA	0.000	0.000		5.000	Nov 2020	14.237	Nov 2021	-		14.237	Continuing	Continuing	Continuing
Glide Phase Defeat Weapon System - Hypersonic Defense - Systems Engineering Support	MIPR	MITRE : VA	0.000	0.000		0.000		1.424	Nov 2021	-		1.424	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604181C / *Hypersonic Defense*	**Project (Number/Name)** MD29 / *Hypersonic Defense*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Glide Phase Defeat Weapon System - Hypersonic Defense - Weapon Concept Definition and Risk Reduction	C/Various	Various : VA	0.000	62.275	Feb 2020	0.000		0.000		-		0.000	0.000	62.275	0.000
Glide Phase Defeat Weapon System - Hypersonic Defense - Weapon System Modification	C/CPIF	Lockheed Martin : NJ	0.000	0.000		101.086	Nov 2020	98.837	Nov 2021	-		98.837	Continuing	Continuing	Continuing
		Subtotal	190.254	275.751		262.549		239.151		-		239.151	Continuing	Continuing	N/A

Remarks

FY 2020 does not include the enacted rescission of $12.5 million for delays in the Glide Phase Defeat Weapon System

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Partnered Flight Test Participation - Partner Flight Test Participation	MIPR	Space and Missile Defense Command/ US Maritime Administration/ Pacific Missile Range Facility/ Ronald Reagan Test Site/ L3/JHU/APL/ MDIOC/ Lockheed Martin/AMRDEC/ NSWC/NAWC : AL/ CA/CO/DC/HI/TN/TX	0.000	104.079	Jan 2020	0.000		0.000		-		0.000	0.000	104.079	0.000
		Subtotal	0.000	104.079		0.000		0.000		-		0.000	0.000	104.079	N/A

Remarks

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604181C / *Hypersonic Defense*	Project (Number/Name) MD29 / *Hypersonic Defense*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	190.254	379.830		262.549		239.151		-		239.151	Continuing	Continuing	N/A

Remarks

Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.
FY 2020 does not reflect the enacted rescission of $25.1 million for MDA hypersonic defense partner tests.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604181C / *Hypersonic Defense*	**Project (Number/Name)** MD29 / *Hypersonic Defense*

Significant Event Complete ▲ Significant Event Planned △ Milestone Decision Complete ★ Milestone Decision Planned ☆ Element Test Complete ◆ Element Test Planned ◇ System Level Test Complete ● System Level Test Planned ○ Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
AN/TPY-2 Capability Development	✦	✦	✦	✦																								
LRDR Capability Development	✦	✦	✦	✦																								
Weapon Systems Concept Definition & Risk Reduction (Phases 1 and 2)	✦	✦	✦	✦																								
Hypersonic Defense Sensor and Weapons Component Technology Performance Testing	✧	✧	✧	✧	✧	✧	✧	✧																				
Hypersonic Threat Sensor Technology Development	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
C2BMC Capability Development	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Hypersonic Defense Sensor & Weapons Component Technology Capability Development	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Weapons Technology Risk Reduction Contract(s) Award			✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Missile System Requirement Review												✧																
Weapons System Requirement Review												✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604181C / *Hypersonic Defense*	**Project (Number/Name)** MD29 / *Hypersonic Defense*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
AN/TPY-2 Capability Development	1	2020	4	2020
LRDR Capability Development	1	2020	4	2020
Weapon Systems Concept Definition & Risk Reduction (Phases 1 and 2)	1	2020	4	2020
Hypersonic Defense Sensor and Weapons Component Technology Performance Testing	1	2020	4	2021
Hypersonic Threat Sensor Technology Development	1	2020	4	2022
C2BMC Capability Development	1	2020	4	2022
Hypersonic Defense Sensor & Weapons Component Technology Capability Development	1	2020	4	2022
Weapons Technology Risk Reduction Contract(s) Award	3	2020	4	2022
Missile System Requirement Review	4	2022	4	2022
Weapons System Requirement Review	4	2022	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604181C / *Hypersonic Defense*	Project (Number/Name) MD40 / *Program Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program Wide Support*	5.390	6.698	10.083	8.780	-	8.780	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	6.698	10.083	8.780
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604181C / *Hypersonic Defense*	**Project (Number/Name)** MD40 / *Program Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the PWS allocation on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.			
Accomplishments/Planned Programs Subtotals	6.698	10.083	8.780

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604181C / *Hypersonic Defense*	**Project (Number/Name)** MD40 / *Program Wide Support*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Facilities and Maintenance	MIPR	Various : AL, CO, CA, VA	0.000	0.000		0.000		6.485	Nov 2021	-		6.485	Continuing	Continuing	Continuing
Program Wide Support - Agency Facilities and Maintenance SRM	MIPR	Various : Multi: AK, AL, CA, CO, HI, VA	0.000	0.000		4.370	Dec 2020	1.084	Dec 2021	-		1.084	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations Management	Various	Various : Multi, AL, CA, CO, VA	0.082	0.100	Aug 2020	1.979	Nov 2020	0.000		-		0.000	0.000	2.161	0.000
Program Wide Support - Agency Operations and Support Other Agency Services	MIPR	Various : Multi: AK/ AL/CA/CO/HI/MD/ VA/NJ/NY/OCONUS	0.000	0.000		0.265	Nov 2020	0.000		-		0.000	0.000	0.265	0.000
Program Wide Support - Agency Operations and Support Services	C/Various	Various : Multi: AK, AL, CA, CO, HI, VA	5.308	0.000		0.000		1.211	Nov 2021	-		1.211	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations, Sustainment and GPC	C/FFP	Various : Multi: AK, AL, CA, HI, NY, NM, VA	0.000	0.000		3.469	Nov 2020	0.000		-		0.000	0.000	3.469	0.000
Program Wide Support - Facilities Maintenance	MIPR	Various : Multi: AK, AL, CA, CO, HI, VA	0.000	6.598	Nov 2019	0.000		0.000		-		0.000	0.000	6.598	0.000
		Subtotal	5.390	6.698		10.083		8.780		-		8.780	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	5.390	6.698		10.083		8.780		-		8.780	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604181C / *Hypersonic Defense*	**Project (Number/Name)** MD40 / *Program Wide Support*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604181C / *Hypersonic Defense*	**Project (Number/Name)** MD40 / *Program Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 0604672C *I Homeland Defense Radar-Hawaii*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	70.735	181.569	133.000	0.000	-	0.000	-	-	-	-	-	-
MD41: *Homeland Defense Radar - Hawaii (HDR-H)*	70.735	174.756	133.000	0.000	-	0.000	-	-	-	-	-	-
MD40: *Program-Wide Support*	-	6.813	0.000	0.000	-	0.000	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

Decrease from FY 2021 to FY 2022 reflects the $133.0 million Congressional Plus Up (CPU) to continue development of the Homeland Defense Radar-Hawaii.

A. Mission Description and Budget Item Justification

The HDR-H Program Element (PE) 0604672C is comprised of a persistent discrimination sensor for the Missile Defense System (MDS). HDR-H addresses United States Northern Command (NORTHCOM) and United States Indo-Pacific Command (INDOPACOM) operational requirements for a near term persistent solution against advancing threats and closes capability gaps. HDR-H provides 24 hours a day, 7 days a week, and 365 days a year tracking and discrimination capability against increasingly complex threats, improves capability of Ballistic Missile Defense (BMD) interceptors, and supports multi-mission areas (e.g., Space Domain Awareness). The radar will leverage development efforts from other sensor projects to enhance discrimination, tracking, and hit assessment to maximize interceptor usage. The Missile Defense Agency (MDA) is reevaluating the HDR-H schedule for earliest radar delivery should a deployment decision be made in the future and the program is budgeted.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	188.480	0.000	0.000	-	0.000
Current President's Budget	181.569	133.000	0.000	-	0.000
Total Adjustments	-6.911	133.000	0.000	-	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	133.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-4.659	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	-2.252	0.000	0.000	-	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0604672C *I Homeland Defense Radar-Hawaii*

Change Summary Explanation

Increase in FY 2021 provides a $133.0 million Congressional Plus Up (CPU) for the continued development of the Homeland Defense Radar-Hawaii.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604672C / *Homeland Defense Radar-Hawaii*	Project (Number/Name) MD41 / *Homeland Defense Radar - Hawaii (HDR-H)*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD41: *Homeland Defense Radar - Hawaii (HDR-H)*	70.735	174.756	133.000	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The FY 2021 Defense Appropriation included a $133 million Congressional Plus Up (CPU) for the continued development of the Homeland Defense Radar-Hawaii.

A. Mission Description and Budget Item Justification

The Homeland Defense Radar-Hawaii (HDR-H) is a 24 hours a day, 7 days a week, 365 days a year persistent tracking and discrimination radar that will provide additional capability to the Ballistic Missile Defense System (BMDS) to support the defense of Hawaii. HDR-H will operate in complex countermeasure environments, and improve defensive capability of Ground-Based Midcourse Defense (GMD). The HDR-H will support multi-mission areas (e.g. Space Situational Awareness (SSA)). The HDR-H is a Solid State, Phased Array, S-Band Radar that is scalable and extensible from initial capability to keep pace with advancing threats. The radar will be integrated into the BMDS architecture through Command and Control Battle Management and Communications (C2BMC) and will provide for the defense of Hawaii using In-Flight Interceptor Communications System Data Terminal (IDT). The HDR-H is comprised of an antenna base, HDR-H Equipment Shelter (HES), a Mission Control Facility (MCF), and Thermal Control System (TCS). The Radar Prime Contractor will be responsible for design, development, erection, and fielding of the HDR-H radar, as well as construction of the HES. An environmental impact statement (EIS) will be completed and used as the basis to determine final site selection. MDA is reevaluating the HDR-H schedule for earliest radar delivery should a deployment decision be made in the future and the program is budgeted.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Homeland Defense Radar - Hawaii (HDR-H)	174.756	133.000	0.000
Articles:	-	-	-
Description: The HDR-H program includes requirements development activities associated with systems engineering, hardware and software development, discrimination improvements, design reviews, testing, and Modeling and Simulation (M&S) efforts for radar development. Efforts include site activation and preparation of site infrastructure for construction activities. The program will develop and integrate C2BMC systems for HDR-H functionality. The program will develop and deliver radar software releases and will conduct Independent Verification and Validation (IV&V) testing of tactical software. The program includes procurement of radar long lead materials, initiation of production for radar components and sub-assemblies, and test of long lead components. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -Continue long lead procurements of critical radar components -Continue Environmental Impact Statement (EIS) effort, site selection, and radar site planning			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604672C / *Homeland Defense Radar-Hawaii*	**Project (Number/Name)** MD41 / *Homeland Defense Radar - Hawaii (HDR-H)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Continue radar design and support facility design -Continue Planning and design of HDR-H Command and Control, Battle Management & Communications -Initiates development of HDR-H common software ***FY 2022 Plans:*** -No funding requested for this effort in FY 2022 ***FY 2021 to FY 2022 Increase/Decrease Statement:*** No funding is requested in FY 2022 for HDR-H.			
Accomplishments/Planned Programs Subtotals	174.756	133.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603882C: *Ballistic Missile Defense Midcourse Defense Segment*	1,275.414	1,219.261	745.144	-	745.144	-	-	-	-	-	-
• 0603884C: *Ballistic Missile Defense Sensors*	348.356	265.803	224.750	-	224.750	-	-	-	-	-	-
• 0603896C: *Ballistic Missile Defense Command and Control, Battle Management & Communication*	550.513	645.741	603.448	-	603.448	-	-	-	-	-	-
• 0604673C: *Pacific Discriminating Radar*	2.921	0.000	0.000	-	0.000	-	-	-	-	-	-
• 0604873C: *Long Range Discrimination Radar (LRDR)*	131.135	138.317	133.335	-	133.335	-	-	-	-	-	-
• 0604879C: *Ballistic Missile Defense Sensor Test*	96.082	64.245	77.428	-	77.428	-	-	-	-	-	-
• 32199903: *MILCON PLANNING and DESIGN*	35.472	0.000	0.000	-	0.000	-	-	-	-	-	-

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604672C / *Homeland Defense Radar-Hawaii*	**Project (Number/Name)** MD41 / *Homeland Defense Radar - Hawaii (HDR-H)*

D. Acquisition Strategy

An acquisition strategy was approved in December 2017 for the procurement of a single Homeland Defense Radar (HDR) for Hawaii. In May of 2018, this acquisition strategy was updated to include the procurement of up to three Homeland Defense Radars. A competitively awarded multiple-award indefinite delivery, indefinite quantity (IDIQ) contract was awarded in July 2018 to three contractors. The first IDIQ delivery order was competitively awarded on December 18, 2018 for the development, construction, integration and testing, and delivery of one HDR to be sited in Hawaii. The HDR-H delivery order contract includes fixed price and cost-reimbursable line items that properly balance acquisition costs and risks. Performance and cost incentives were included to motivate contractor performance. The HDR-H delivery order contract includes the requirement for the radar prime to deliver a full technical data package (TDP) that will enable the Government to effectively and affordably sustain the system. MDA is reevaluating the HDR-H schedule for earliest radar delivery should a deployment decision be made in the future and the program is budgeted.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604672C / *Homeland Defense Radar-Hawaii*	Project (Number/Name) MD41 / *Homeland Defense Radar - Hawaii (HDR-H)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Homeland Defense Radar - Hawaii (HDR-H) - Civilians/Travel	Allot	MDA : Various	0.972	2.537	Oct 2019	2.565	Sep 2021	0.000		-		0.000	0.000	6.074	0.000
Homeland Defense Radar - Hawaii (HDR-H) - Communications Integration	SS/CPIF	Lockheed Martin : AL	0.057	2.921	Mar 2020	4.370	Sep 2021	0.000		-		0.000	0.000	7.348	0.000
Homeland Defense Radar - Hawaii (HDR-H) - Contractor Support Services	C/CPFF	MDA Various : AL	2.389	7.720	Oct 2019	4.120	Sep 2021	0.000		-		0.000	0.000	14.229	0.000
Homeland Defense Radar - Hawaii (HDR-H) - FFRDC/UARC	MIPR	GTRI, JHU/APL, MITRE : GA, VA, AL	2.031	3.044	Oct 2019	1.350	Sep 2021	0.000		-		0.000	0.000	6.425	0.000
Homeland Defense Radar - Hawaii (HDR-H) - Lead Service Cell	C/CPFF	MDA Various : AL, CO	0.308	0.000		0.000		0.000		-		0.000	0.000	0.308	0.000
Homeland Defense Radar - Hawaii (HDR-H) - Prime Contractor	C/FPIF	Lockheed Martin : NJ	61.151	148.259	Jan 2020	103.000	Jun 2021	0.000		-		0.000	0.000	312.410	0.000
Homeland Defense Radar - Hawaii (HDR-H) - Radar Material	MIPR	Air Force : GA	0.175	0.000		0.000		0.000		-		0.000	0.000	0.175	0.000
Homeland Defense Radar - Hawaii (HDR-H) - Site Activation & Studies	MIPR	Various : AL, HI	3.652	10.275	Mar 2020	17.595	Sep 2021	0.000		-		0.000	0.000	31.522	0.000
		Subtotal	70.735	174.756		133.000		0.000		-		0.000	0.000	378.491	N/A

Remarks

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604672C / *Homeland Defense Radar-Hawaii*	Project (Number/Name) MD41 / *Homeland Defense Radar - Hawaii (HDR-H)*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	70.735	174.756		133.000		0.000		-		0.000	0.000	378.491	N/A

Remarks

Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604672C / *Homeland Defense Radar-Hawaii*	**Project (Number/Name)** MD41 / *Homeland Defense Radar - Hawaii (HDR-H)*

Significant Event Complete ▲ Milestone Decision Complete ★ Element Test Complete ◆ System Level Test Complete ● Complete Activity ✦
Significant Event Planned △ Milestone Decision Planned ☆ Element Test Planned ◇ System Level Test Planned ○ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
Homeland Defense Radar - Hawaii (HDR-H)	✧	✧	✧	✧	✧	✧	✧	✧																				

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604672C / *Homeland Defense Radar-Hawaii*	**Project (Number/Name)** MD41 / *Homeland Defense Radar - Hawaii (HDR-H)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Homeland Defense Radar - Hawaii (HDR-H)	1	2020	4	2021

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604672C / *Homeland Defense Radar-Hawaii*	Project (Number/Name) MD40 / *Program-Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program-Wide Support*	-	6.813	0.000	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

No funding requested in FY 2021 and the outyears.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	6.813	0.000	0.000
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604672C / *Homeland Defense Radar-Hawaii*	**Project (Number/Name)** MD40 / *Program-Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** N/A ***FY 2022 Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	6.813	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604672C / *Homeland Defense Radar-Hawaii*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Operations and Support Services	C/Various	Various : Multi: AL, CA, CO, VA	0.000	6.813	Dec 2019	0.000		0.000		-		0.000	0.000	6.813	0.000
		Subtotal	0.000	6.813		0.000		0.000		-		0.000	0.000	6.813	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	6.813		0.000		0.000		-		0.000	0.000	6.813	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604672C / *Homeland Defense Radar-Hawaii*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program Wide Support	✦	✦	✦	✦																								

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604672C / *Homeland Defense Radar-Hawaii*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program Wide Support	1	2020	4	2020

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 0604673C *I Pacific Discriminating Radar*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	14.453	2.921	0.000	0.000	-	0.000	-	-	-	-	-	-
MD51: *Pacific Radar (PAC Radar)*	14.453	1.366	0.000	0.000	-	0.000	-	-	-	-	-	-
MD40: *Program Wide Support*	-	1.555	0.000	0.000	-	0.000	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

Due to a shift in Department of Defense (DoD) priorities, the Department is no longer pursuing the development and fielding of a Pacific Discriminating Radar beginning in FY 2021. Decrease from FY 2020 to FY 2021 reflects this change.

A. Mission Description and Budget Item Justification

The Pacific Discriminating Radar Program Element is comprised of the PAC Radar program, a persistent discrimination sensor for the Missile Defense System (MDS).

Due to a shift in DoD priorities, the Department is no longer pursuing the development and fielding of a Pacific Discriminating Radar beginning in FY 2021.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	6.711	0.000	0.000	-	0.000
Current President's Budget	2.921	0.000	0.000	-	0.000
Total Adjustments	-3.790	0.000	0.000	-	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-2.316	0.000			
• SBIR/STTR Transfer	-0.132	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	-1.342	0.000	0.000	-	0.000

Change Summary Explanation

Decrease in FY 2020 reflects the Omnibus Above Threshold Reprogramming which transferred $2.316 million to finance Indian incentive payments and a $1.342 million realignment to a classified priority.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0604673C *I Pacific Discriminating Radar*

Due to a shift in Department of Defense priorities, the Department is no longer pursuing the development and fielding of a Pacific Discriminating Radar beginning in FY 2021. Decrease from FY 2020 to FY 2021 reflects this change.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604673C / *Pacific Discriminating Radar*	Project (Number/Name) MD51 / *Pacific Radar (PAC Radar)*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD51: *Pacific Radar (PAC Radar)*	14.453	1.366	0.000	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Due to a shift in Department of Defense priorities, the Department is no longer pursuing the development and fielding of a Pacific Discriminating Radar beginning in FY 2021. Decrease from FY 2020 to FY 2021 reflects this change.

A. Mission Description and Budget Item Justification

The mission of the PAC Radar program office is to define, develop, acquire, field, and sustain the radar as an element of the MDS. It was envisioned to provide persistent tracking, midcourse discrimination, and hit assessment to support the defense of the Homeland against long-range missile threats and defense against regional threats in the U.S. Indo-Pacific Command (USINDOPACOM) area of responsibility.

Due to a shift in Department of Defense priorities, the Department is no longer pursuing the development and fielding of a Pacific Discriminating Radar beginning in FY 2021.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Pacific Radar (PAC Radar)	1.366	0.000	0.000
Articles:	-	-	-
Description: Due to a shift in Department of Defense priorities, the Department is no longer pursuing the development and fielding of a Pacific Discriminating Radar beginning in FY 2021. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - No funding requested ***FY 2022 Plans:*** - No funding requested ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	1.366	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604673C / *Pacific Discriminating Radar*	**Project (Number/Name)** MD51 / *Pacific Radar (PAC Radar)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603884C: *Ballistic Missile Defense Sensors*	348.356	265.803	224.750	-	224.750	-	-	-	-	-	-
• 0603896C: *Ballistic Missile Defense Command and Control, Battle Management & Communication*	550.513	645.741	603.448	-	603.448	-	-	-	-	-	-
• 0604672C: *Homeland Defense Radar-Hawaii*	181.569	133.000	0.000	-	0.000	-	-	-	-	-	-
• 0604873C: *Long Range Discrimination Radar (LRDR)*	131.135	138.317	133.335	-	133.335	-	-	-	-	-	-
• 0604879C: *Ballistic Missile Defense Sensor Test*	96.082	64.245	77.428	-	77.428	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The PAC Radar acquisition strategy was approved in December 2017. The PAC Radar procurement was planned as part of the Multiple-Award Indefinite Delivery Indefinite Quantity (MAIDIQ) contract that would include the full/open competitive award of the Delivery Order for the PAC Radar no later than FY 2023. Due to a shift in Department of Defense priorities, the Department is no longer pursuing the development and fielding of a Pacific Discriminating Radar beginning in FY 2021.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604673C / *Pacific Discriminating Radar*	Project (Number/Name) MD51 / *Pacific Radar (PAC Radar)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Pacific Radar (PAC Radar) - Civilian/Travel	Allot	MDA : Various	0.474	0.589	Oct 2019	0.000		0.000		-		0.000	0.000	1.063	0.000
Pacific Radar (PAC Radar) - Communications Integration	SS/CPIF	Lockheed Martin : AL	5.618	0.000		0.000		0.000		-		0.000	0.000	5.618	0.000
Pacific Radar (PAC Radar) - Contractor Support Services	Various	Various : Various	2.921	0.527	Oct 2019	0.000		0.000		-		0.000	0.000	3.448	0.000
Pacific Radar (PAC Radar) - FFRDC/UARC	MIPR	GTRI : GA	4.455	0.250	Oct 2019	0.000		0.000		-		0.000	0.000	4.705	0.000
Pacific Radar (PAC Radar) - Site Activation & Studies	C/CPFF	Various : Various	0.985	0.000		0.000		0.000		-		0.000	0.000	0.985	0.000
		Subtotal	14.453	1.366		0.000		0.000		-		0.000	0.000	15.819	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	14.453	1.366		0.000		0.000		-		0.000	0.000	15.819	N/A

Remarks

Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604673C / *Pacific Discriminating Radar*	**Project (Number/Name)** MD51 / *Pacific Radar (PAC Radar)*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
Pacific Radar	✦	✦	✦	✦																								

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604673C / *Pacific Discriminating Radar*	**Project (Number/Name)** MD51 / *Pacific Radar (PAC Radar)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Pacific Radar	1	2020	4	2020

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604673C / *Pacific Discriminating Radar*	Project (Number/Name) MD40 / *Program Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program Wide Support*	-	1.555	0.000	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2020, Program Wide Support (PWS) was proportionately reallocated to the Pacific Discriminating Radar program element. PWS is allocated on a pro-rata basis across multiple Agency PE's each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	1.555	0.000	0.000
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604673C / *Pacific Discriminating Radar*	**Project (Number/Name)** MD40 / *Program Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** N/A ***FY 2022 Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	1.555	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604673C / *Pacific Discriminating Radar*	Project (Number/Name) MD40 / *Program Wide Support*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AL, VA	0.000	1.555	Dec 2019	0.000		0.000		-		0.000	0.000	1.555	0.000
		Subtotal	0.000	1.555		0.000		0.000		-		0.000	0.000	1.555	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	1.555		0.000		0.000		-		0.000	0.000	1.555	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604673C / *Pacific Discriminating Radar*	**Project (Number/Name)** MD40 / *Program Wide Support*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✦	✦	✦	✦																								

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604673C / *Pacific Discriminating Radar*	**Project (Number/Name)** MD40 / *Program Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2020

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0604873C *I Long Range Discrimination Radar (LRDR)*

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	906.782	131.135	138.317	133.335	-	133.335	-	-	-	-	-	-
MD96: *Long Range Discrim Radar (LRDR)*	859.259	126.158	132.865	128.192	-	128.192	-	-	-	-	-	-
MD40: *Program Wide Support*	47.523	4.977	5.452	5.143	-	5.143	-	-	-	-	-	-

Program MDAP/MAIS Code: 362

Note

Decrease from FY 2021 to FY 2022 reflects the completion of Long Range Discrimination Radar (LRDR) Increment 6B.1 effort required for LRDR to be added to the Operational Capacity Baseline.

A. Mission Description and Budget Item Justification

The mission of the LRDR program is to design, develop, integrate, deliver, field, and sustain the LRDR as an element of the Missile Defense System (MDS) Increment 6B.1 Homeland Defense (HLD) Capability. This capability is representative of LRDR Configuration 1. Initial fielding of the LRDR was planned for late 2020 leading to approval to add LRDR to the MDS Operational Capacity Baseline (OCB) in FY 2021 and an Operational Acceptance (OA) by the United States Space Force (USSF) in FY 2023. Those milestones were impacted by a cessation of work at Clear Air Force Station, AK in the spring of 2020 to mitigate the potential spread of COVID-19. Initial fielding of LRDR is delayed until FY 2022 and LRDR will now be added to the OCB in FY 2022. Configuration 2 represents MDS Increment 6C/7, which includes software upgrades to LRDR to assess and further improve discrimination techniques and capability which will expand capability to a broader spectrum of threats, increase support to Space Domain Awareness and Space Object Identification, and implement cost reduction initiatives to reduce life cycle operating costs. The OCB/ Technical Capability Declaration (TCD) for Configuration 2 is planned for FY 2024. The LRDR is comprised of a LRDR Equipment Shelter (LES), housing two radar array faces, a Mission Control Facility (MCF), which supports radar operations, and supporting facilities and infrastructure. The Secretary of the Air Force approved Clear Air Force Station, AK as the LRDR site. The USSF Space Operations Command (SpOC) is the designated Lead Major Command (MAJCOM).

The LRDR operates in the S-band frequency, features scalable and open systems architecture to mitigate evolving threats, and integrates into the MDS through the Command and Control, Battle Management, and Communications (C2BMC) system. This Program Element includes MDS threat discrimination improvements to enhance MDS effectiveness against the evolving threat. The result will be a MDS architecture more capable of discriminating and intercepting re-entry vehicles with a higher degree of confidence to improve Warfighter shot doctrine, and conserve Ground-Based Defense (GMD) interceptor inventory. LRDR also supports additional mission areas including Space Domain Awareness.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0604873C *I Long Range Discrimination Radar (LRDR)*

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	136.423	137.256	118.787	-	118.787
Current President's Budget	131.135	138.317	133.335	-	133.335
Total Adjustments	-5.288	1.061	14.548	-	14.548
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	1.061			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-3.371	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	-1.917	0.000	14.548	-	14.548

Change Summary Explanation

The $1.061 million increase in FY 2021 provides a portion of the undistributed Congressional add to restore Defense Wide Review (DWR) Missile Defense Agency manpower reduction.

The $14.548 million increase in FY 2022 provides funding related to COVID-19 impacts.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604873C / *Long Range Discrimination Radar (LRDR)*	Project (Number/Name) MD96 / *Long Range Discrim Radar (LRDR)*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD96: *Long Range Discrim Radar (LRDR)*	859.259	126.158	132.865	128.192	-	128.192	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The decrease from FY 2021 to FY 2022 reflects the completion of LRDR Increment 6B.1 effort required for LRDR to be added to the Operational Capacity Baseline.

A. Mission Description and Budget Item Justification

This project includes the development of a Configuration 1 Long Range Discrimination Radar (LRDR) which will provide an improved persistent midcourse MDS discrimination capability in the Pacific sensor architecture. The initial fielding of the Configuration 1 LRDR capability will be completed by FY 2022 and operational fielding of LRDR will be completed when added to the Operational Capacity Baseline (OCB) in late FY 2022 leading to Operational Acceptance (OA) by the United States Space Force (USSF) in FY 2023. The LRDR will also increase the defensive capacity of the Ground-Based Midcourse Defense (GMD) interceptor inventory and address evolving threats. MDA's request includes funding for the design and development of the LRDR, system engineering, software development, software Independent Verification and Validation (IV&V), qualification testing, developmental testing support, Modeling and Simulation (M&S), and acquisition sustainment. M&S includes development of LRDR digital simulations and their integration into the MDS, M&S architecture, and Verification, Validation, and Accreditation (VV&A) of LRDR models. The USSF will leverage the LRDR inherent capabilities to augment ancillary missions including Space Object Identification and Space Situational Awareness.

This project also includes Configuration 2 software upgrades. Configuration 2 represents MDS Increment 6C/7 which includes software upgrades to LRDR to further verify and improve discrimination techniques and capability, verify and improve electronic protection techniques and capability, expand capability to a broader spectrum of threats, increase support to Space Domain Awareness and Space Object Identification, and implement cost reduction initiatives to reduce life cycle operating costs. Technical Capability Declaration for Configuration 2 is planned for FY 2024.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Long Range Discrimination Radar (LRDR)	126.158	132.865	128.192
Articles:	-	-	-
Description: The LRDR program includes requirement development activities associated with systems engineering, software development, discrimination improvements, design reviews, testing, and M&S efforts for radar development. Efforts include LRDR site activation and preparation of site infrastructure for construction activities. The program will develop and integrate C2BMC systems for LRDR functionality. The program will develop, maintain, and deliver radar software Build 1 and establish the Independent Verification and Validation (IV&V) lab for testing of operational software. The program includes purchase, manufacture, integration and test of radar materials. This program will also establish the operational baseline, initiate radar			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604873C / *Long Range Discrimination Radar (LRDR)*	**Project (Number/Name)** MD96 / *Long Range Discrim Radar (LRDR)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
operations and communication, and initiate sustainment operations. The program also includes logistics management, reliability, availability, maintainability (RAM) efforts, data management, and operations support for the LRDR program office. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -- Complete LRDR integration at Clear Air Force Station (CAFS) Alaska and Initiate system testing -- Complete acceptance testing for the delivery of Configuration 1/Government acceptance of radar (DD250) -- Initiate the Missile Defense Operations Centers (MDOCs) for LRDR -- Initiate support to ground and flight test programs -- Complete cybersecurity testing -- Continue planning and readiness for sustainment of Configuration 1 system -- Initiate Configuration 2 software development -- Initiate iterative System Requirements Review (SRR) process for Configuration 2 -- Provides funding for estimated COVID-19 impacts ***FY 2022 Plans:*** -- Achieve Authority to Operate -- Achieve final Government acceptance of radar (DD 250) -- Complete LRDR addition to the Operational Capacity Baseline for Increment 6B.1 -- Continue efforts to achieve Operational Acceptance by USSF by FY 2023 -- Continue Configuration 2 development --Cost Reduction Initiative to reduce power consumption --Enhanced Space Domain Awareness (SDA) / Space Object Identification (SOI) messaging --Expanded reporting / messaging --Cybersecurity upgrades -- Complete iterative SRR process for Configuration 2 -- Complete Preliminary Design Review (PDR) and Critical Design Review (CDR) for Configuration 2 -- Continue post-fielding operations and sustainment -- Complete demobilization of Temporary Workforce Camp (TWC) at CAFS ***FY 2021 to FY 2022 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604873C / *Long Range Discrimination Radar (LRDR)*	**Project (Number/Name)** MD96 / *Long Range Discrim Radar (LRDR)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Decrease from FY 2021 to FY 2022 reflects the completion of LRDR Increment 6B.1 effort required for LRDR to be added to the Operational Capacity Baseline.			
Accomplishments/Planned Programs Subtotals	126.158	132.865	128.192

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603882C: *Ballistic Missile Defense Midcourse Defense Segment*	1,275.414	1,219.261	745.144	-	745.144	-	-	-	-	-	-
• 0603884C: *Ballistic Missile Defense Sensors*	348.356	265.803	224.750	-	224.750	-	-	-	-	-	-
• 0603896C: *Ballistic Missile Defense Command and Control, Battle Management & Communication*	550.513	645.741	603.448	-	603.448	-	-	-	-	-	-
• 0603904C: *Missile Defense Integration and Operations Center (MDIOC)*	54.783	55.356	52.403	-	52.403	-	-	-	-	-	-
• 0604672C: *Homeland Defense Radar-Hawaii*	181.569	133.000	0.000	-	0.000	-	-	-	-	-	-
• 0604873C: *Long Range Discrimination Radar MILCON*	0.000	0.000	0.000	-	0.000	-	-	-	-	-	-
• 0604879C: *Ballistic Missile Defense Sensor Test*	96.082	64.245	77.428	-	77.428	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The LRDR acquisition strategy, which was approved on January 7, 2015, incorporates robust acquisition practices to ensure delivery of a best value solution that meets mission performance requirements and reduces lifecycle costs. MDA awarded a fixed-price incentive contract to Lockheed Martin Corporation of Moorestown, NJ, on October 21, 2015 to design, develop, manufacture, integrate & test, and field the LRDR prime mission equipment. The prime contract included other fixed-price and cost-reimbursable line items and options in order to properly balance acquisition costs and risks. Performance and cost incentives were included to motivate contractor performance. The radar prime contractor will deliver a full technical data package, which will enable the government to effectively and affordably sustain the system.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604873C / *Long Range Discrimination Radar (LRDR)*	**Project (Number/Name)** MD96 / *Long Range Discrim Radar (LRDR)*

MDA will synchronize the radar development contract efforts with a simultaneous Military Construction (MILCON) effort, which will be executed through the US Army Corps of Engineers. The LRDR is expected to complete development and initial fielding in FY 2022 for MDS integration and testing of Configuration 1 and in 2024 for Configuration 2.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604873C / *Long Range Discrimination Radar (LRDR)*	**Project (Number/Name)** MD96 / *Long Range Discrim Radar (LRDR)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Long Range Discrimination Radar (LRDR) - BMEWS Remediation and Removal	MIPR	USACE : AL, AK	25.110	0.000		0.000		0.000		-		0.000	0.000	25.110	0.000
Long Range Discrimination Radar (LRDR) - Civilians/ Travel	Allot	MDA : AL	2.413	3.462	Oct 2019	3.736	Oct 2020	3.725	Oct 2021	-		3.725	Continuing	Continuing	Continuing
Long Range Discrimination Radar (LRDR) - Communications Integration	SS/CPIF	Lockheed Martin : AL, NJ	27.719	7.267	May 2020	1.417	May 2021	0.732	May 2022	-		0.732	Continuing	Continuing	Continuing
Long Range Discrimination Radar (LRDR) - Contract Support Services	Various	Various : Various	5.257	4.152	Oct 2019	3.400	Oct 2020	6.127	Oct 2021	-		6.127	Continuing	Continuing	Continuing
Long Range Discrimination Radar (LRDR) - FFRDC/ UARC/OGA	MIPR	GTRI, JHU/APL, MITRE, MIT/LL : AL, GA, IL, MA, VA	3.385	2.657	Oct 2019	3.876	Oct 2020	2.390	Oct 2021	-		2.390	Continuing	Continuing	Continuing
Long Range Discrimination Radar (LRDR) - Hybrid Program Office	MIPR	US Air Force : Various	0.000	0.692	Oct 2019	0.000		0.000		-		0.000	0.000	0.692	0.000
Long Range Discrimination Radar (LRDR) - IV&V	MIPR	AMRDEC : Huntsville, AL	11.493	3.853	Nov 2019	4.653	Nov 2020	4.388	Nov 2021	-		4.388	Continuing	Continuing	Continuing
Long Range Discrimination Radar (LRDR) - Prime Contractor -Configuration 1	C/FPIF	Lockheed Martin : NJ	677.677	81.524	Nov 2019	74.617	Nov 2020	17.884	Nov 2021	-		17.884	Continuing	Continuing	Continuing
Long Range Discrimination Radar (LRDR) - Prime Contractor -Configuration 2	SS/CPIF	Lockheed Martin : NJ	0.000	0.000		1.902	Jan 2021	67.000	Oct 2021	-		67.000	Continuing	Continuing	Continuing
Long Range Discrimination Radar (LRDR) - Program Office - No longer funded in this cost category	Various	MDA, JHU/APL, GSA AL, MA, IL : AL, MA, IL	10.616	0.000		0.000		0.000		-		0.000	0.000	10.616	0.000
Long Range Discrimination Radar (LRDR) - Radar	MIPR	USAF : AK	0.000	9.134	Oct 2019	20.796	Nov 2020	24.006	Nov 2021	-		24.006	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604873C / *Long Range Discrimination Radar (LRDR)*	**Project (Number/Name)** MD96 / *Long Range Discrim Radar (LRDR)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Operations, Sustainment, and Fuel															
Long Range Discrimination Radar (LRDR) - Site Activation & Studies	MIPR	USACE : AL, AK	95.589	13.417	Feb 2020	14.891	Feb 2021	1.710	Feb 2022	-		1.710	Continuing	Continuing	Continuing
Long Range Discrimination Radar (LRDR) - Transition & Transfer	C/TBD	MDA : AL	0.000	0.000		3.577	Jan 2021	0.230	Jan 2022	-		0.230	Continuing	Continuing	Continuing
		Subtotal	859.259	126.158		132.865		128.192		-		128.192	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	859.259	126.158		132.865		128.192		-		128.192	Continuing	Continuing	N/A

Remarks

Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604873C / *Long Range Discrimination Radar (LRDR)*	**Project (Number/Name)** MD96 / *Long Range Discrim Radar (LRDR)*

Significant Event Complete ▲ Significant Event Planned △ Milestone Decision Complete ★ Milestone Decision Planned ☆ Element Test Complete ◆ Element Test Planned ◇ System Level Test Complete ● System Level Test Planned ○ Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
Long Range Discrimination Radar Capability	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
GTI-08a (N/I) (MDS Ground Test)				✧	✧	✧	✧	✧																				
System Requirements Review for Configuration 2							△																					
Initial Fielding									△																			
GTD-08a (N/I) (MDS Ground Test)										✧																		
GTI-08b Sprint 1 (N/I) (MDS Ground Test)											✧																	
FTX-45											△																	
LRDR Operational Capacity Baseline (OCB) / Increment 6B.1 Technical Capability Declaration (TCD)												△																
FTX-26 (OT) (SN, OT Target Only Flight Test)												△																
SICO-08b (MDS Ground Test)												✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604873C / *Long Range Discrimination Radar (LRDR)*	**Project (Number/Name)** MD96 / *Long Range Discrim Radar (LRDR)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Long Range Discrimination Radar Capability	1	2020	4	2022
GTI-08a (N/I) (MDS Ground Test)	4	2020	4	2021
System Requirements Review for Configuration 2	3	2021	3	2021
Initial Fielding	1	2022	1	2022
GTD-08a (N/I) (MDS Ground Test)	2	2022	2	2022
GTI-08b Sprint 1 (N/I) (MDS Ground Test)	3	2022	3	2022
FTX-45	3	2022	3	2022
LRDR Operational Capacity Baseline (OCB) / Increment 6B.1 Technical Capability Declaration (TCD)	4	2022	4	2022
FTX-26 (OT) (SN, OT Target Only Flight Test)	4	2022	4	2022
SICO-08b (MDS Ground Test)	4	2022	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604873C / *Long Range Discrimination Radar (LRDR)*	Project (Number/Name) MD40 / *Program Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program Wide Support*	47.523	4.977	5.452	5.143	-	5.143	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency program elements (PEs) each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	4.977	5.452	5.143
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; the FSRM program			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604873C / *Long Range Discrimination Radar (LRDR)*	**Project (Number/Name)** MD40 / *Program Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
(formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	4.977	5.452	5.143

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604873C / *Long Range Discrimination Radar (LRDR)*	**Project (Number/Name)** MD40 / *Program Wide Support*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Facilities and Maintenance SRM (MIPR)	MIPR	Various : Multi: AL, VA, Aust, Japan	24.395	0.000		0.000		0.000		-		0.000	0.000	24.395	0.000
Program Wide Support - Agency Operations Management	Various	Various : Multi: AL, CA, CO, VA	0.550	0.075	Jul 2020	0.000		0.000		-		0.000	0.000	0.625	0.000
Program Wide Support - Agency Operations Sustainment and GPC	C/FFP	Various : Multi: AL, CA, CO, VA etc.	2.327	0.000		0.000		0.000		-		0.000	0.000	2.327	0.000
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AL, VA	15.125	4.902	Jul 2020	5.452	Apr 2021	5.143	Jan 2022	-		5.143	Continuing	Continuing	Continuing
Program Wide Support - Prior year no longer funded in the FYDP	Various	Various : Various	5.126	0.000		0.000		0.000		-		0.000	0.000	5.126	0.000
		Subtotal	47.523	4.977		5.452		5.143		-		5.143	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	47.523	4.977		5.452		5.143		-		5.143	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604873C / *Long Range Discrimination Radar (LRDR)*	**Project (Number/Name)** MD40 / *Program Wide Support*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604873C / *Long Range Discrimination Radar (LRDR)*	**Project (Number/Name)** MD40 / *Program Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

THIS PAGE INTENTIONALLY LEFT BLANK

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 0604874C *I Improved Homeland Defense Interceptors*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	1,778.393	514.062	860.384	926.125	-	926.125	-	-	-	-	-	-
MD15: *Risk Reduction*	-	155.000	200.000	0.000	-	0.000	-	-	-	-	-	-
MD80: *Next Generation Interceptor Development (NGI)*	-	310.000	634.005	890.206	-	890.206	-	-	-	-	-	-
MD97: *Improved HD Interceptors*	1,716.064	35.643	0.000	0.000	-	0.000	-	-	-	-	-	-
MD40: *Program Wide Support*	62.329	13.419	26.379	35.919	-	35.919	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

FY 2020 does not include the enacted rescission of $214.0 million. The increase from FY 2021 to FY 2022 provides for two contractors through Critical Design Review (CDR) to develop the Next Generation Interceptor (NGI) and maximize the likelihood of delivering this critical capability at the earliest possible opportunity. It supports award of the NGI Competitive Development and key NGI Program enablers such as Operations, Government Labs and Analysis, and Modeling and Simulations (M&S) serving as critical risk reduction capabilities for the earliest delivery of an NGI operational deployment. The increase is also due to refinement of initial government estimates based on early information from the NGI solicitation and proposals.

A. Mission Description and Budget Item Justification

The Improved Homeland Defense Interceptor Program Element will deliver a NGI for Homeland Defense, resulting in fulfillment of the warfighter's needs and enhancement of homeland defense. USNORTHCOM develops Operational Needs for the NGI. The NGI acquisition covers the development, integration and testing of an All Up Round (AUR) boost vehicle/ kill vehicle system capable of surviving both the natural and hostile environments while countering the allocated threats. The NGI will provide the Warfighter a cost-effective solution that is lethal across the specified threat space and extensible to address future and evolving threats. The Government issued a Request for Proposal in FY 2020 for an NGI acquisition, which covers the development, integration and testing of an AUR boost vehicle/ kill vehicle system.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0604874C *I Improved Homeland Defense Interceptors*

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	515.000	664.138	921.349	-	921.349
Current President's Budget	514.062	860.384	926.125	-	926.125
Total Adjustments	-0.938	196.246	4.776	-	4.776
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-6.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	202.246			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.938	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	0.000	0.000	4.776	-	4.776

Change Summary Explanation

FY 2020 does not include the enacted rescission of $214.0 million.

Increase in FY 2021 provides the enacted congressional net increase of $196.246 million. $200.000 million increase provides for GMD risk reduction and $2.246 million provides a portion of the undistributed congressional add to restore Defense Wide Review (DWR) Missile Defense Agency manpower reductions. FY 2021 also reflects the $6.000 million congressional reduction for Next Generation Interceptor contract award delay.

Increase in FY 2022 funds the NGI program to the OSD CAPE ICE, provides two contractors through CDR to develop the NGI and maximizes the likelihood of delivering this critical capability at the earliest possible opportunity. It supports award of the NGI Competitive Development and key NGI Program enablers such as Operations, Government Labs and Analysis, and M&S, serving as critical risk reduction capabilities for the earliest delivery of an NGI operational deployment.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604874C / *Improved Homeland Defense Interceptors*	Project (Number/Name) MD15 / *Risk Reduction*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD15: *Risk Reduction*	-	155.000	200.000	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The FY 2020 Congressional Plus-up for Pre-NGI Risk reduction homeland defense capabilities was realigned from MD80 to MD15. The $200 million FY 2021 Congressional increase provides GMD program risk reduction activities during the design and development phase of the NGI program.

A. Mission Description and Budget Item Justification

Risk Reduction for enhancing existing homeland defense against near- and mid-term threats that focuses on the entire GMD Weapon System ensures optimal operation and warfighting capability.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Risk Reduction	155.000	200.000	0.000
Articles:	-	-	-
Description: Risk Reduction for enhancing existing homeland defense and post-NGI fielding capabilities against near- and mid-term threats. Funding used to build up payload for flight test Boost Vehicle Test (BVT)-03, integrate a Ground Based Interceptor (GBI) from available components, update software to bring mid-term discrimination capabilities to the Capability Enhancement-I fleet, install enhanced maintenance built-in testing equipment, install improved high-altitude electromagnetic pulse (HEMP) protection improvements, implement digital engineering plan, complete improved lethality engineering, and improved survivability modeling. ***FY 2021 Plans:*** -Risk reduction activities are undergoing continual technical assessments and refinements including reliability and performance improvements to the GMD weapon system and the expansion of GMD SLEP -Enables critical program risk reduction activities during the design and development phase of the NGI program ***FY 2022 Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The funding in FY 2021 is a Congressional Plus Up (CPU) for enhancing existing homeland defense against near- and mid-term threats that focuses on the entire GMD Weapon System ensures optimal operation and warfighting capability.			
Accomplishments/Planned Programs Subtotals	155.000	200.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604874C / *Improved Homeland Defense Interceptors*	**Project (Number/Name)** MD15 / *Risk Reduction*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603882C: *Ballistic Missile Defense Midcourse Defense Segment*	1,275.414	1,219.261	745.144	-	745.144	-	-	-	-	-	-
• 0604874C: *Improved Homeland Defense Interceptors*	514.062	860.384	926.125	-	926.125	-	-	-	-	-	-
• 0604887C: *Ballistic Missile Defense Midcourse Defense Segment Test*	96.711	67.071	61.424	-	61.424	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604874C / *Improved Homeland Defense Interceptors*	**Project (Number/Name)** MD15 / *Risk Reduction*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Risk Reduction - Risk Reduction - Risk Reduction	C/CPIF	Various : Various	0.000	155.000	Sep 2020	200.000	Jun 2021	0.000		-		0.000	0.000	355.000	0.000
		Subtotal	0.000	155.000		200.000		0.000		-		0.000	0.000	355.000	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	155.000		200.000		0.000		-		0.000	0.000	355.000	N/A

Remarks

N/A

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604874C / *Improved Homeland Defense Interceptors*	**Project (Number/Name)** MD15 / *Risk Reduction*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
Risk Reduction - Risk Reduction FY 2020	✦	✦	✦	✦																								
Risk Reduction - Risk Reduction FY 2021					✧	✧	✧	✧																				

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604874C / *Improved Homeland Defense Interceptors*	**Project (Number/Name)** MD15 / *Risk Reduction*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Risk Reduction - Risk Reduction FY 2020	1	2020	4	2020
Risk Reduction - Risk Reduction FY 2021	1	2021	4	2021

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604874C / *Improved Homeland Defense Interceptors*	Project (Number/Name) MD80 / *Next Generation Interceptor Development (NGI)*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD80: *Next Generation Interceptor Development (NGI)*	-	310.000	634.005	890.206	-	890.206	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The increase from FY 2021 to FY 2022 funds the program to the OSD CAPE ICE for two contractors through CDR to develop the NGI and supports funding for the NGI Program Operations and Government Labs. It supports award of the NGI Competitive Development and key NGI Program enablers such as Operations, Government Labs and Analysis, and M&S. This serves as critical risk reduction capability for the USNORTHCOM developed Operational Needs for the NGI, as GM develops, produces, fields, and delivers this capability while meeting the cost, schedule, and performance parameters. The increase is also due to refinement of initial government estimates based on early information from the NGI solicitation and proposals. (Note, NGI FYDP program funding is also included in Program Elements 0603915C, Targets and 0603914C, BMD Test).

A. Mission Description and Budget Item Justification

The Improved Homeland Defense Interceptor Program Element will deliver an NGI for Homeland Defense. The NGI acquisition covers the development, integration and testing of an AUR boost vehicle (BV)/ kill vehicle (KV) system capable of surviving both the natural and hostile environments while countering the allocated threats. NGI is the most important requirement for the warfighters and supports the National Security and Military strategies. The NGI will provide the Warfighter a cost-effective solution that is lethal across the specified threat space and extensible to address future and evolving threats. The Government issued a Request for Proposal in FY 2020 for an NGI acquisition, which covers the development, integration and testing of an AUR boost vehicle/ kill vehicle system. The Government is using two contractors through CDR to develop the NGI.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Next Generation Interceptor Development (NGI)	303.317	622.991	869.612
Articles:	-	-	-
Description: The Improved Homeland Defense Interceptor Program Element will deliver an NGI for Homeland Defense. The NGI has improved survivability against natural and hostile environments and increases performance capability against 2030 threats compared to the currently fielded GBIs. Recurring efforts include: -Continue the design, development, and parts testing of the NGI payload and boost vehicle utilizing two prime contractors -Continue activities to support achieving Knowledge Point #1 exit criteria, successful completion of the Preliminary Design Review. These activities include: -Continue purchase and initiate testing of NGI parts and initiate testing to gain early confidence in NGI design			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604874C / *Improved Homeland Defense Interceptors*	**Project (Number/Name)** MD80 / *Next Generation Interceptor Development (NGI)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Continue Parts, Materials, and Processes Board Requirements (PMPCB) approval for all parts -Continue to initiate efforts to improve battlespace and threat containment requirement analysis ***FY 2021 Plans:*** -Design, develop, and test the NGI payload and boost vehicle utilizing two prime contractors -Complete System Requirements Review (SRR) to establish the functional baseline for the NGI design -Initiate activities to support achieving Knowledge Point #1 exit criteria, successful completion of the Preliminary Design Review. These activities include: -Complete interceptor, boost vehicle- and kill vehicle-level SRRs -Initiate purchase of NGI parts and initiate testing to gain early confidence in NGI design -Initiate Parts, Materials, and Processes Board Requirements (PMPCB) approval for all parts -Initiate battlespace and threat containment requirement analysis ***FY 2022 Plans:*** - Initiate purchase of long-lead materials for the initial AUR test articles - Purchase of NGI parts and testing to gain early confidence in NGI design and development by building in reliability into design - Purchase of NGI parts and testing to continue initiation of battlespace and threat containment requirement analysis ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The increase from FY 2021 to FY 2022 funds the program to the OSD CAPE ICE and provides an increase to support two contractors through CDR to develop the NGI and maximizes the likelihood of delivering this critical capability at the earliest possible opportunity. It supports award of the NGI Competitive Development and key NGI Program enablers such as Operations, Government Labs and Analysis, and Modeling & Simulations, serving as critical risk reduction capabilities for the earliest delivery of an NGI operational deployment.			
Title: Program Operations	6.683	11.014	20.594
Articles:	-	-	-
Description: Program Operations provides for integrated program management of the Improved HD Interceptor efforts including: -Technical and business management support, financial management, cost and schedule performance analysis, cost estimation and analysis, configuration management, and integration activities to ensure the program meets cost, schedule, and performance goals -GMD NGI program compliance with internal and external direction, policies, and regulations to deliver critical capability via a consistent and disciplined process			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604874C / *Improved Homeland Defense Interceptors*	**Project (Number/Name)** MD80 / *Next Generation Interceptor Development (NGI)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Mission Assurance and Manufacturing Engineering processes to include quality, configuration management, manufacturing, engineering, and safety in all phases of the system life cycle, throughout the supply chain and at all levels of assembly emphasizing high yield rates which minimize test and rework costs -Technical and testing oversight, verification of hardware and software development, quality / safety / mission assurance, integrated logistics support, and government manpower and infrastructure to develop, test, and sustain the NGI Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -SEE ABOVE. ***FY 2022 Plans:*** -SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides for technical risk mitigation leading to CDR. Funding supports required increased technical and programmatic subject matter expertise, Other Government Agency (OGA) reviews and subject matter expertise for preliminary design validation and verification efforts. Funding also supports inclusion of Digital Engineering, Software Development, Security and Operations (DevSecOps), and Model Based Systems Engineering (MBSE) initiatives to reduce cost, schedule and performance risk in program execution for the competitive effort.			
Accomplishments/Planned Programs Subtotals	310.000	634.005	890.206

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208866C: MD08: *BMD Midcourse Defense O&M*	152.235	148.749	156.623	-	156.623	-	-	-	-	-	-
• 0208866C: MD08: *GMD Procurement*	285.471	150.000	0.000	-	0.000	-	-	-	-	-	-
• 0603882C: *Ballistic Missile Defense Midcourse Defense Segment*	1,275.414	1,219.261	745.144	-	745.144	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604874C / *Improved Homeland Defense Interceptors*	**Project (Number/Name)** MD80 / *Next Generation Interceptor Development (NGI)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0604874C: *Improved Homeland Defense Interceptors*	514.062	860.384	926.125	-	926.125	-	-	-	-	-	-
• 0604887C: *Ballistic Missile Defense Midcourse Defense Segment Test*	96.711	67.071	61.424	-	61.424	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

Acquisition strategy includes a competitive source selection to develop and test an AUR interceptor to meet Warfighter requirements and defeat the 2030+ threat. MDA has established multiple knowledge points and flight tests to evaluate component and system performance during development, followed by production decisions. The Government plans to utilize two contractors through CDR to develop the NGI and maximize the likelihood of delivering this critical capability at the earliest possible opportunity.

NGI is the first of the contract actions submitted as part of the new strategy roadmap. This is a new, competitive effort independent of the Development and Sustainment Contract (DSC). The goal of NGI is to design, develop, test, and field a new generation of Midcourse Defense interceptors to meet the increasing demands of adversary threats in terms of capability and capacity. NGI tenets include robust design efforts to address lifecycle sustainability and viability. The NGI contract will oversee the fielding of a new, improved interceptor along with any modifications to the missile silos needed to integrate into the GMD enterprise.

The NGI effort will include, but is not limited to, systems engineering, hardware, software, and firmware development, manufacture, integration and checkout/test, and delivery of NGI's, culminating in three (3) intercept flight tests. Based on successful capability demonstration during flight tests, MDA will seek approval from the Under Secretary of Defense for Acquisition and Sustainment (USD(A&S)) to proceed with procurement of operational AURs.

The NGI will be an integrated capability of the greater ground-based element and will provide a fully qualified, production representative NGI AUR. It will be the cognizant authority of the ground-based integrator to assume interoperability and systems integration once the NGI AUR is accepted by the Government. The NGI will be constrained to the existing silo dimensions. Industry will propose all changes required to the weapon system interfaces and to silo infrastructure to support their proposed solution in their competitive proposals. All equipment from the silo wall inward is available trade space. Any future interface changes will be coordinated with the ground-based integrator, approved by the Government, and flowed to the GMD contract(s) via contract modification.

The NGI awarded two best value contracts on March 24, 2021. MDA competitively awarded two contracts for the NGI and plans to maintain competition through the CDR in FY 2025.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604874C / *Improved Homeland Defense Interceptors*	**Project (Number/Name)** MD80 / *Next Generation Interceptor Development (NGI)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Next Generation Interceptor Development (NGI) - NGI Development	C/CPIF	Lockheed-Martin, Northrop-Grumman : AL	0.000	302.429	Mar 2021	617.864	Mar 2021	849.383	Nov 2021	-		849.383	Continuing	Continuing	Continuing
Next Generation Interceptor Development (NGI) - NGI Development Lab & System Support	C/CPIF	Lockheed-Martin, Northrop-Grumman : AL	0.000	0.888	Mar 2021	5.127	Mar 2021	0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	0.000	303.317		622.991		849.383		-		849.383	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Next Generation Interceptor Development (NGI) - NGI Development	C/CPIF	Lockheed-Martin, Northrop-Grumman : AL	0.000	0.000		0.000		15.000	Mar 2022	-		15.000	Continuing	Continuing	Continuing
Next Generation Interceptor Development (NGI) - NGI Development Lab & System Support	C/CPIF	CCDC, Torch Technologies Inc. : AL	0.000	0.000		0.000		5.229	Mar 2022	-		5.229	Continuing	Continuing	Continuing
Program Operations - Contract Support Services	C/CPFF	Various : AL/AK/ CA/ CO/VA	0.000	5.070	Oct 2019	5.885	Oct 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Program Operations - Government Civilian Salaries	MIPR	MDA : AL/VA	0.000	1.613	Oct 2019	4.640	Oct 2020	8.064	Oct 2021	-		8.064	Continuing	Continuing	Continuing
Program Operations - Government Travel	MIPR	MDA : AL/VA	0.000	0.000		0.489	Oct 2020	0.499	Oct 2021	-		0.499	Continuing	Continuing	Continuing
		Subtotal	0.000	6.683		11.014		28.792		-		28.792	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604874C / *Improved Homeland Defense Interceptors*	Project (Number/Name) MD80 / *Next Generation Interceptor Development (NGI)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Operations - Contract Support Services	C/CPFF	A.I. Solutions, APT Research, BCF Solutions, Parsons, Venturi, Yorktown, Veterans Tech, MacAulay-Brown, TBD : AL	0.000	0.000		0.000		12.031	Oct 2021	-		12.031	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		12.031		-		12.031	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	310.000		634.005		890.206		-		890.206	Continuing	Continuing	N/A

Remarks

$5,229 for Next Generation Interceptor Development - NGI Development and Lab Support moved from Product Development to Product Support to correct the cost category.
$12,031 for Program Operations, Contract Support Services moved from Product Support to Management Services to correct the cost category.
Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604874C / *Improved Homeland Defense Interceptors*	**Project (Number/Name)** MD80 / *Next Generation Interceptor Development (NGI)*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

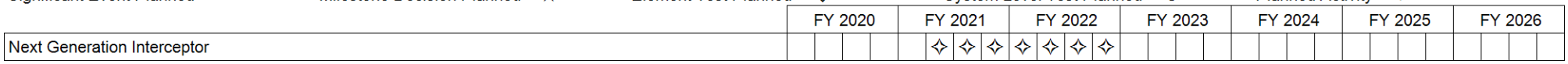


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604874C / *Improved Homeland Defense Interceptors*	**Project (Number/Name)** MD80 / *Next Generation Interceptor Development (NGI)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Next Generation Interceptor	2	2021	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604874C / *Improved Homeland Defense Interceptors*	Project (Number/Name) MD97 / *Improved HD Interceptors*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD97: *Improved HD Interceptors*	1,716.064	35.643	0.000	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY 2020 - FY 2025 funding was previously realigned and adjusted from MD97 Improved Homeland Defense Interceptors to MD80 NGI. Sufficient funds are available to settle RKV termination issue.

A. Mission Description and Budget Item Justification

The improved Homeland Defense interceptor included a Redesigned Kill Vehicle (RKV) and the All Up Round (AUR) engineering necessary to integrate the RKV with new and existing booster configurations. The RKV program was terminated in August 2019.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Improved Homeland Defense (HLD) Interceptor Development	32.605	0.000	0.000
Articles:	-	-	-
Description: HLD Interceptor development objectives included redesigning the Ground-Based Defense (GMD) kill vehicle (KV), implementing tactical booster modifications, and conducting AUR system engineering. The RKV program was terminated in August 2019.			
FY 2021 Plans: N/A. RKV terminated in August 2019.			
FY 2022 Plans: N/A			
FY 2021 to FY 2022 Increase/Decrease Statement: N/A			
Title: Program Operations	3.038	0.000	0.000
Articles:	-	-	-
Description: Program Operations provided for integrated program management of the Improved Homeland Defense Interceptor efforts.			
FY 2021 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604874C / *Improved Homeland Defense Interceptors*	**Project (Number/Name)** MD97 / *Improved HD Interceptors*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
N/A; RKV terminated August 2019. ***FY 2022 Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	35.643	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208866C: MD08: *GMD Procurement*	285.471	150.000	0.000	-	0.000	-	-	-	-	-	-
• 0208866C: MD08: *Midcourse Defense O&M*	152.235	148.749	156.623	-	156.623	-	-	-	-	-	-
• 0603882C: *Ballistic Missile Defense Midcourse Defense Segment*	1,275.414	1,219.261	745.144	-	745.144	-	-	-	-	-	-
• 0604874C: *Improved Homeland Defense Interceptors*	514.062	860.384	926.125	-	926.125	-	-	-	-	-	-
• 0604887C: *Ballistic Missile Defense Midcourse Defense Segment Test*	96.711	67.071	61.424	-	61.424	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

MDA executed an acquisition strategy to develop an integrated RKV with a Cross-Industry team design solution. This concept included production sources from industry and provided a consolidated product that included the collective knowledge of and leveraged capabilities from the industry leaders in kill vehicle design and development. The industry teaming method incorporated the most viable technical approach from each contractor and allowed for combination of resources to shorten the learning curve and reduce the time needed to develop and begin initial production. This strategy allowed for industry to provide the best value and best design solution for the MDA while setting the conditions for future competition of production. The development phase was followed by initial production and then a competitive full rate production phase. The competitive production phase encompassed the purchase, production, and the integration of the proven components demonstrated in the development phase and provided competitive benefits to the Government. This strategy allowed industry to provide the best value and best design solution for

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604874C / *Improved Homeland Defense Interceptors*	**Project (Number/Name)** MD97 / *Improved HD Interceptors*

MDA while setting the conditions for future competition of production. The Government, as the design authority, retained responsibility for the execution of the program cost, schedule, and the technical performance of the RKV to meet requirements levied on the contractor. The Government implemented a rigorous systems engineering process to ensure that the design and development efforts met requirements. This acquisition strategy was documented in the RKV Acquisition Plan signed by the Defense Acquisition Executive in October 2015.

In January of 2018, the MDA Director signed an Acquisition Strategy Decision Memorandum (ASDM) changing the acquisition strategy to execute the Missile Defeat and Defense Enhancement (MDDE) scope. The Development and Sustainment Contract (DSC) would continue with the Boeing Company to 1Q FY 2024 to build the 20 GBI's and 20 Silos with supporting test, engineering, software, and performance based logistics scope. The Justification and Approval for this action was signed by the MDA Director on 2 January 2018.

The RKV program was terminated in August 2019.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604874C / *Improved Homeland Defense Interceptors*	**Project (Number/Name)** MD97 / *Improved HD Interceptors*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Improved Homeland Defense (HLD) Interceptor Development - GBI Consolidated Integration Facility Improvements	C/CPIF	Boeing : AL/AK/AZ	9.279	0.000		0.000		0.000		-		0.000	0.000	9.279	0.000
Improved Homeland Defense (HLD) Interceptor Development - OGA/ FFRDC Booster Avionics Risk Reduction	MIPR	Draper : AL/CA	1.644	0.000		0.000		0.000		-		0.000	0.000	1.644	0.000
Improved Homeland Defense (HLD) Interceptor Development - PRIME AUR System Engineering and Development	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	49.840	0.000		0.000		0.000		-		0.000	0.000	49.840	0.000
Improved Homeland Defense (HLD) Interceptor Development - PRIME RKV Development	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	1,478.907	32.545	Nov 2019	0.000		0.000		-		0.000	0.000	1,511.452	0.000
Improved Homeland Defense (HLD) Interceptor Development - Post-Intercept Assessment	C/CPIF	Boeing AL/AK/AZ : CA/CO/TX/VA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	0.000
Improved Homeland Defense (HLD) Interceptor Development - Prior year no longer funded in the FYDP	Various	Various : Various	21.114	0.000		0.000		0.000		-		0.000	0.000	21.114	0.000
Improved Homeland Defense (HLD) Interceptor Development - RKV Development Lab and System Support	MIPR	AMRDEC : Redstone Arsenal, AL	99.929	0.060	Nov 2019	0.000		0.000		-		0.000	0.000	99.989	0.000
		Subtotal	1,660.713	32.605		0.000		0.000		-		0.000	0.000	1,693.318	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604874C / *Improved Homeland Defense Interceptors*	Project (Number/Name) MD97 / *Improved HD Interceptors*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Termination of the RKV program in August 2019 resulted in no cost to complete/total cost/target value of contract for MD97.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Operations - Contract Support Services	C/CPFF	Various AL/AK/ : CA/ CO/VA	32.420	2.604	Oct 2019	0.000		0.000		-		0.000	0.000	35.024	0.000
Program Operations - FFRDC Support	MIPR	MIT : LL AL	3.132	0.000		0.000		0.000		-		0.000	0.000	3.132	0.000
Program Operations - Government Civilian Salaries	MIPR	MDA : AL/VA	10.418	0.434	Oct 2019	0.000		0.000		-		0.000	0.000	10.852	0.000
Program Operations - Other Government Agencies	MIPR	Various AL/VA : FL/ CO	8.178	0.000		0.000		0.000		-		0.000	0.000	8.178	0.000
Program Operations - Prior year no longer funded in the FYDP	Various	Various : Various	0.552	0.000		0.000		0.000		-		0.000	0.000	0.552	0.000
Program Operations - Travel	MIPR	MDA : AL/VA	0.651	0.000		0.000		0.000		-		0.000	0.000	0.651	0.000
		Subtotal	55.351	3.038		0.000		0.000		-		0.000	0.000	58.389	N/A

Remarks

Termination of the RKV program in August 2019 results in no cost to complete/total cost/target value of contract for MD97.

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,716.064	35.643		0.000		0.000		-		0.000	0.000	1,751.707	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604874C / *Improved Homeland Defense Interceptors*	Project (Number/Name) MD97 / *Improved HD Interceptors*	

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604874C / *Improved Homeland Defense Interceptors*	**Project (Number/Name)** MD97 / *Improved HD Interceptors*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
RKV Terminated August 2019	▲						

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604874C / *Improved Homeland Defense Interceptors*	**Project (Number/Name)** MD97 / *Improved HD Interceptors*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
RKV Terminated August 2019	1	2020	1	2020

Note

RKV terminated August 2019. Next Generation Interceptor development was realigned to MD80. Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604874C / *Improved Homeland Defense Interceptors*	Project (Number/Name) MD40 / *Program Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program Wide Support*	62.329	13.419	26.379	35.919	-	35.919	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	13.419	26.379	35.919
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the STEM program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; the FSRM program (formerly Real Property Maintenance) to keep the Department's			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604874C / *Improved Homeland Defense Interceptors*	**Project (Number/Name)** MD40 / *Program Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides the PWS allocation on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.			
Accomplishments/Planned Programs Subtotals	13.419	26.379	35.919

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604874C / *Improved Homeland Defense Interceptors*	**Project (Number/Name)** MD40 / *Program Wide Support*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Facilities and Maintenance	MIPR	Various Multi : AL, VA	23.595	5.218	Nov 2019	2.492	Nov 2020	2.978	Dec 2021	-		2.978	Continuing	Continuing	Continuing
Program Wide Support - Agency Facilities and Maintenance SRM	MIPR	Various : Multi: AK, AL, CA, CO, HI, NY, VA	0.000	0.000		0.000		3.775	Dec 2021	-		3.775	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Civilian Salaries, Travel, Training	Various	Various Multi : AL, VA	0.755	0.201	Nov 2019	1.500	Nov 2020	0.000		-		0.000	0.000	2.456	0.000
Program Wide Support - Agency Operations and Support Other Agency Services	MIPR	Various Multi : AL, VA	15.086	0.000		4.450	Nov 2020	2.980	Nov 2021	-		2.980	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various Multi : AL, VA	22.893	8.000	Dec 2019	17.937	Dec 2020	22.626	Nov 2021	-		22.626	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations, Sustainment and GPC	C/FFP	Various : Multi: AK, AL, CA, HI, NY, VA	0.000	0.000		0.000		3.560	Dec 2021	-		3.560	Continuing	Continuing	Continuing
		Subtotal	62.329	13.419		26.379		35.919		-		35.919	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	62.329	13.419		26.379		35.919		-		35.919	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604874C / *Improved Homeland Defense Interceptors*	**Project (Number/Name)** MD40 / *Program Wide Support*

Significant Event Complete ▲ Milestone Decision Complete ★ Element Test Complete ◆ System Level Test Complete ● Complete Activity ✦
Significant Event Planned △ Milestone Decision Planned ☆ Element Test Planned ◇ System Level Test Planned ○ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604874C / *Improved Homeland Defense Interceptors*	**Project (Number/Name)** MD40 / *Program Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 0604876C *I Ballistic Missile Defense Terminal Defense Segment Test*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	279.300	24.771	1.000	32.697	-	32.697	-	-	-	-	-	-
MT07: *THAAD Test*	265.838	24.051	0.691	30.174	-	30.174	-	-	-	-	-	-
MD40: *Program Wide Support*	13.462	0.720	0.309	2.523	-	2.523	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

Increase from FY 2021 to FY 2022 is in accordance with the current Integrated Master Test Plan (IMTP).

A. Mission Description and Budget Item Justification

Ballistic Missile Defense Terminal Defense Segment Test provides the Terminal High Altitude Area Defense (THAAD) program's participation in Missile Defense System (MDS) Flight Tests and Ground Tests in accordance with the IMTP. THAAD Test coordinates with Operational Test Agencies, conducts pretest planning, coordination and analysis, conducts flight test operations, performs post-flight test reporting, and performs data distribution and storage.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	25.137	7.768	72.388	-	72.388
Current President's Budget	24.771	1.000	32.697	-	32.697
Total Adjustments	-0.366	-6.768	-39.691	-	-39.691
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-6.768			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	-0.366	0.000	-39.691	-	-39.691

Change Summary Explanation

Decrease in FY 2021 reflects Congressional reduction for prior year test asset carryover.

Decrease in FY 2022 is in accordance with the current IMTP.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604876C / *Ballistic Missile Defense Terminal Defense Segment Test*	Project (Number/Name) MT07 / *THAAD Test*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MT07: *THAAD Test*	265.838	24.051	0.691	30.174	-	30.174	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Increase from FY 2021 to FY 2022 is in accordance with the current Integrated Master Test Plan (IMTP).

A. Mission Description and Budget Item Justification

Terminal High Altitude Area Defense (THAAD) Test conducts Missile Defense System (MDS) Flight Tests and Ground Tests with other MDS elements (such as Army Navy / Transportable Radar Surveillance and Control (AN/TPY-2), MDS Command, Control, Battle Management, and Communication (C2BMC), Phased Array Tracking Intercept of Target (PATRIOT), and Aegis) in accordance with the IMTP. THAAD Test coordinates with Operational Test Agencies, conducts all pre and post flight test, ground test, cyber security enhancements, and wargames and exercises requirements.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Flight Test Execution	7.056	0.000	16.280
Articles:	-	-	-
Description: Performs all requirements to support flight test execution such as mission planning, pre-flight integration testing, conduct of readiness reviews, test asset transportation, flight test execution and data collection, post flight test reporting and data distribution in accordance with the IMTP. Specific and/or unique planned accomplishments to each FY are as follows: ***FY 2021 Plans:*** N/A. ***FY 2022 Plans:*** -SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 is in accordance with the current IMTP.			
Title: Ground Test Execution	5.550	0.000	7.475
Articles:	-	-	-
Description: Ground Test Execution includes:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604876C / *Ballistic Missile Defense Terminal Defense Segment Test*	**Project (Number/Name)** MT07 / *THAAD Test*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- THAAD participation in MDA Ground Test operational scenario events to validate THAAD's ability to conduct coordinated engagements with Aegis and PATRIOT operating with C2BMC and AN/TPY-2. - Pre-mission planning, pre- and post-mission analyses, reporting, and execution to support MDS Ground and Flight Test campaigns. - Ground Test of element hardware and software prior to hardware-in-the-loop (HWIL) testing and enable a continuous capacity based Sprint vs. lengthy individual Ground Test (GT) campaign environment, enabling a more efficient process for ground testing and reducing test cycle time. - Continued performance assessments to evaluate system performance and interoperability within the integrated MDS. Specific and/or unique planned accomplishments to each FY are as follows: ***FY 2021 Plans:*** N/A. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 is in accordance with the current IMTP.			
Title: Resources	2.394	0.000	1.722
Articles:	-	-	-
Description: Resources includes: - On-site range support for THAAD maintenance, repair, and pre-mission analysis to ensure THAAD test asset readiness. - Data management, facilities operations, and post-test reporting in support of MDS tests to ensure data collection and readiness for mission execution. - Performance Assessments to evaluate system performance and interoperability within the integrated MDS. Specific and/or unique planned accomplishments to each FY are as follows: ***FY 2021 Plans:*** N/A. ***FY 2022 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604876C / *Ballistic Missile Defense Terminal Defense Segment Test*	**Project (Number/Name)** MT07 / *THAAD Test*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 is in accordance with the current IMTP.			
Title: Wargames and Exercises	0.505	0.000	0.447
Articles:	-	-	-
Description: Wargames and Exercises support the Combatant Commands (CCMDs) with model and simulations and subject matter expertise during exercise events. Continue to assist in developing/refining Tactics, Techniques, and Procedures and Pre-Planned Responses to incorporate in future events. Demonstrate THAAD capability to the warfighter community in the Integrated and Missile Defense (IAMD) environment. Specific and/or unique planned accomplishments to each FY are as follows: ***FY 2021 Plans:*** N/A. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 is in accordance with the current IMTP.			
Title: Test Program Operations	8.546	0.691	4.250
Articles:	-	-	-
Description: Program Operations provides strategic planning, program integration, acquisition, engineering, financial management, internal reviews and audits, and program assessments for THAAD Test Activities. Specific and/or unique planned accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604876C / *Ballistic Missile Defense Terminal Defense Segment Test*	**Project (Number/Name)** MT07 / *THAAD Test*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Increase from FY 2021 to FY 2022 is in accordance with the current IMTP.			
Accomplishments/Planned Programs Subtotals	24.051	0.691	30.174

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208866C:MD07: *THAAD O&M*	86.425	89.903	86.828	-	86.828	-	-	-	-	-	-
• 0208866C:MD07: *THAAD Procurement*	407.203	578.335	251.543	-	251.543	-	-	-	-	-	-
• 0603881C: *Ballistic Missile Defense Terminal Defense Segment*	295.312	312.317	277.949	-	277.949	-	-	-	-	-	-
• 0603914C: *Ballistic Missile Defense Test*	398.939	365.208	362.906	-	362.906	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

THAAD awards Indefinite Delivery Indefinite Quantity (IDIQ) Task Orders on the Advanced Capability Development (ACD) contract for the continuation of THAAD development and test as described and approved in the MDA Integrated Master Test Plan. The discrete task orders allow management and tracking of IMTP-related work.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604876C / *Ballistic Missile Defense Terminal Defense Segment Test*	**Project (Number/Name)** MT07 / *THAAD Test*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Program Operations - Program Operations	Various	Missile Defense Agency (MDA) : Ft. Belvoir, VA/ Huntsville, AL	8.448	8.546	Oct 2019	0.691	Oct 2020	4.250	Oct 2021	-		4.250	Continuing	Continuing	Continuing
		Subtotal	8.448	8.546		0.691		4.250		-		4.250	Continuing	Continuing	N/A

Remarks

N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Flight Test Execution - Execution, Support and Planning	MIPR	MDA / US Army Combat Capabilities Development Command (CCDC) / KLC / RTS : AL / CO / AK / HI / Wake Island / Kwajalein	118.011	3.541	Nov 2019	0.000		9.505	Nov 2021	-		9.505	Continuing	Continuing	Continuing
Flight Test Execution - Planning, Analysis, and Execution	SS/IDIQ	Lockheed Martin : Sunnyvale, CA / Huntsville, AL	76.163	3.515	Nov 2019	0.000		6.775	Nov 2021	-		6.775	Continuing	Continuing	Continuing
Ground Test Execution - MDS Ground Test Support	MIPR	US Army Combat Capabilities Development Command (CCDC) : Huntsville, AL	27.248	5.550	Nov 2019	0.000		7.475	Nov 2021	-		7.475	Continuing	Continuing	Continuing
Resources - All Prior Years	Various	Various : Various	5.961	0.000		0.000		0.000		-		0.000	0.000	5.961	0.000
Resources - Test and Range Infrastructure	MIPR	US Army Combat Capabilities Development Command (CCDC) / White Sands Missile	28.476	2.394	Nov 2019	0.000		1.722	Nov 2021	-		1.722	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604876C / *Ballistic Missile Defense Terminal Defense Segment Test*	Project (Number/Name) MT07 / *THAAD Test*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Range / Lincoln Labs : Huntsville, AL / White Sands, NM / MA													
Wargames and Exercises - Wargames and Exercises	MIPR	MDA / Space and Missile Defense Command : Huntsville, AL	1.531	0.505	Nov 2019	0.000		0.447	Nov 2021	-		0.447	Continuing	Continuing	Continuing
		Subtotal	257.390	15.505		0.000		25.924		-		25.924	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	265.838	24.051		0.691		30.174		-		30.174	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604876C / *Ballistic Missile Defense Terminal Defense Segment Test*	**Project (Number/Name)** MT07 / *THAAD Test*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
FTX-39 (LTPO, DT Target Only Flight Test)	▲																											
GTI-07c (N/I) (MDS Ground Test)	✦																											
GTI-20 Sprint 1(E/C) (MDS Ground Test)		✦																										
FTP-27 E2 (LTPO, DT/OT Flight Test)		▲																										
GTI-20 Sprint 2 (JEON) (MDS Ground Test)			✦																									
FTP-27 E1 (LTPO, DT/OT Flight Test)				▲																								
TH CTV-01 (LTPO, DT Interceptor Only Flight Test)								△																				
FTT-21 (TH, DT Intercept Flight Test)								△																				
GTI-08b Sprint 1 (N/I) (MDS Ground Test)											✧																	

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604876C / *Ballistic Missile Defense Terminal Defense Segment Test*	**Project (Number/Name)** MT07 / *THAAD Test*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
FTX-39 (LTPO, DT Target Only Flight Test)	1	2020	1	2020
GTI-07c (N/I) (MDS Ground Test)	1	2020	1	2020
GTI-20 Sprint 1(E/C) (MDS Ground Test)	2	2020	2	2020
FTP-27 E2 (LTPO, DT/OT Flight Test)	2	2020	2	2020
GTI-20 Sprint 2 (JEON) (MDS Ground Test)	3	2020	3	2020
FTP-27 E1 (LTPO, DT/OT Flight Test)	4	2020	4	2020
TH CTV-01 (LTPO, DT Interceptor Only Flight Test)	4	2021	4	2021
FTT-21 (TH, DT Intercept Flight Test)	4	2021	4	2021
GTI-08b Sprint 1 (N/I) (MDS Ground Test)	3	2022	3	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604876C / *Ballistic Missile Defense Terminal Defense Segment Test*	Project (Number/Name) MD40 / *Program Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program Wide Support*	13.462	0.720	0.309	2.523	-	2.523	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency Program Elements (PE) each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	0.720	0.309	2.523
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the STEM program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; the FSRM program (formerly Real Property Maintenance) to keep the Department's			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604876C / *Ballistic Missile Defense Terminal Defense Segment Test*	**Project (Number/Name)** MD40 / *Program Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides the PWS allocation on a pro-rata basis across multiple Agency PE's each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.			
Accomplishments/Planned Programs Subtotals	0.720	0.309	2.523

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604876C / *Ballistic Missile Defense Terminal Defense Segment Test*	**Project (Number/Name)** MD40 / *Program Wide Support*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Operations Management	Various	Various : Multi: AL, VA, Aust, Japan	0.073	0.011	Jul 2020	0.010	Jul 2021	0.026	Jul 2022	-		0.026	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Civilian Salaries, Travel, Training	Various	Various : VA	4.174	0.000		0.000		0.000		-		0.000	0.000	4.174	0.000
Program Wide Support - Agency Operations and Support International and Materiel and Readiness	MIPR	Various : Multi: AL, VA, Aust, Japan	0.000	0.360	Jul 2020	0.000		0.000		-		0.000	0.000	0.360	0.000
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AL, VA	8.641	0.349	Jun 2020	0.299	May 2021	2.497	Nov 2021	-		2.497	Continuing	Continuing	Continuing
Program Wide Support - Prior year no longer funded in the FYDP	Various	Various : Various	0.574	0.000		0.000		0.000		-		0.000	0.000	0.574	0.000
		Subtotal	13.462	0.720		0.309		2.523		-		2.523	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	13.462	0.720		0.309		2.523		-		2.523	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604876C / *Ballistic Missile Defense Terminal Defense Segment Test*	**Project (Number/Name)** MD40 / *Program Wide Support*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604876C / *Ballistic Missile Defense Terminal Defense Segment Test*	**Project (Number/Name)** MD40 / *Program Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 0604878C / *Aegis BMD Test*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	518.438	167.364	71.498	117.055	-	117.055	-	-	-	-	-	-
MC13: *Network _System Certification and Accreditation - C&A*	-	0.000	0.634	0.000	-	0.000	-	-	-	-	-	-
MT09: *AEGIS BMD Test*	499.750	161.403	64.076	111.996	-	111.996	-	-	-	-	-	-
MD40: *Program Wide Support*	18.688	5.961	6.788	5.059	-	5.059	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

Increase from FY 2021 to FY 2022 is in accordance with the current Integrated Master Test Plan (IMTP).

A. Mission Description and Budget Item Justification

The Aegis Ballistic Missile Defense (BMD) mission is to deliver an enduring, operationally effective, and supportable BMD capability to defend the nation, deployed forces, friends, and allies and to increase this capability by delivering evolutionary improvements as part of Missile Defense System (MDS) upgrades. The Aegis element of the BMDS capitalizes upon and evolves from the existing U.S. Navy Aegis Weapons System (AWS) and Standard Missile (SM) infrastructures. Aegis BMD provides a forward-deployable, mobile capability to detect and track Ballistic Missiles of all ranges and the ability to destroy Short-Range Ballistic Missiles (SRBMs), Medium-Range Ballistic Missiles (MRBMs), and Intermediate-Range Ballistic Missiles (IRBMs) in the midcourse phase of flight in addition to shorter range missiles in the terminal phase of flight. Aegis BMD also provides a Long Range Surveillance and Track (LRS&T) capability to the MDS. Upgrades to both the Aegis Weapon System and the SM-3 configuration provides effective and supportable defensive capability against longer range more sophisticated threats and an enduring Aegis Ashore defensive capability.

- Working with all U.S. Armed Services that participate in the BMDS level Operational Test Agency (OTA) Team, with the support of the Director of Operational Test and Evaluation (DOT&E), MDA has developed a test program to improve confidence in missile defense capabilities under development and ensure the capabilities transferred to the warfighter are operationally effective, suitable, and survivable.
- As part of the MDA's rigorous test program, System Pre-Flight predictions provide confidence in test execution by predicting element performance and exercising element interfaces. System Post-Flight Reconstruction replicates the BMDS configuration, actual environmental conditions, and target dynamics observed in flight to anchor Modeling and Simulation (M&S) results.
- The IMTP is event-oriented and extends until the collection of all identified data is completed ensuring adequate test investments.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0604878C *I Aegis BMD Test*

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	169.822	170.880	191.744	-	191.744
Current President's Budget	167.364	71.498	117.055	-	117.055
Total Adjustments	-2.458	-99.382	-74.689	-	-74.689
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-99.382			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	-2.458	0.000	-74.689	-	-74.689

Change Summary Explanation

Decrease in FY 2021 reflects Congressional reductions for AEGIS underlay test funding early to need and prior year test asset carryover.
Decrease in FY 2022 reflects BMD participation in accordance with the current Integrated Master Test Plan (IMTP).

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604878C / *Aegis BMD Test*	Project (Number/Name) MC13 / *Network _System Certification and Accreditation - C&A*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MC13: *Network _System Certification and Accreditation - C&A*	-	0.000	0.634	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

New accomplishment in FY 2021 provides Aegis Ground Test participation for Cyber Testing Runs-for-Record.

Decrease from FY 2021 to FY 2022 reflects the transition of BMDS-level and IMTP cyber testing to the Aegis BMD Ground Test Accomplishment to align with the DoD/CIO FY 2022 budget guidance and definition of cyber test funding in the Financial Management Regulation (FMR).

A. Mission Description and Budget Item Justification

Cyber testing is for Aegis Ground Test participation in Cyber Testing Runs-for-Record. The IMTP re-plan modified the Ground Test schedule to reflect updated cyber philosophy to characterize BMDS Cyber resilience and inform decisions on improving BMDS Cybersecurity.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Network / System Certification and Accreditation (C&A)	0.000	0.634	0.000
Articles:	-	-	-
Description: Aegis Ground Test participation for Cyber Testing Runs-for-Record (RFR). ***FY 2021 Plans:*** - Support BMDS cybersecurity objectives to determine risks to BMDS components, networks, and systems. Assess and characterize mission risks posed by threat exploitation. ***FY 2022 Plans:*** -N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the transition of BMDS-level and IMTP cyber testing to the Aegis BMD Ground Test Accomplishment to align with the DoD/CIO FY 2022 budget guidance and the definition of cyber test funding in the FMR.			
Accomplishments/Planned Programs Subtotals	0.000	0.634	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604878C / *Aegis BMD Test*	**Project (Number/Name)** MC13 / *Network _System Certification and Accreditation - C&A*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603892C: *AEGIS BMD*	722.582	877.336	732.512	-	732.512	-	-	-	-	-	-
• 0604880C: *Land Based SM-3 (LBSM3)*	36.918	56.628	43.158	-	43.158	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604878C / *Aegis BMD Test*	**Project (Number/Name)** MC13 / *Network _System Certification and Accreditation - C&A*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Network / System Certification and Accreditation (C&A) - Aegis BMD Network / Systems Certifications and Accreditation	MIPR	Various : VA, CA, NJ, MD	0.000	0.000		0.634	Dec 2020	0.000		-		0.000	0.000	0.634	0.000
		Subtotal	0.000	0.000		0.634		0.000		-		0.000	0.000	0.634	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.634		0.000		-		0.000	0.000	0.634	N/A

Remarks

N/A

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604878C / *Aegis BMD Test*	**Project (Number/Name)** MC13 / *Network _System Certification and Accreditation - C&A*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MC13 Cyber Operations					✧	✧	✧	✧																				

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604878C / *Aegis BMD Test*	**Project (Number/Name)** MC13 / *Network _System Certification and Accreditation - C&A*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MC13 Cyber Operations	1	2021	4	2021

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604878C / *Aegis BMD Test*	Project (Number/Name) MT09 / *AEGIS BMD Test*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MT09: *AEGIS BMD Test*	499.750	161.403	64.076	111.996	-	111.996	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Increase from FY 2021 to FY 2022 is in accordance with the current IMTP.

A. Mission Description and Budget Item Justification

The FY 2020 Aegis BMD Test Program concentrates on critical IMTP flight tests that support the U.S. Navy and European Phased Adaptive Approach (EPAA), Weapon System Certification, and Missile Production Decision requirements. Aegis BMD will concentrate on Aegis Baseline (BL) 9.C2 (BMD 5.x) and Standard Missile SM-3 Block IIA operational testing.

The FY 2021 Aegis BMD Test Program concentrates on critical IMTP flight tests that support the BMDS incremental development strategy and the U.S. Navy, European Phased Adaptive Approach (EPAA).

The FY 2022 Aegis BMD Test Program concentrates on critical IMTP flight tests that support the U.S. Navy and European Phased Adaptive Approach (EPAA), Weapon System Certification, and Missile Production Decision requirements. Aegis BMD will concentrate on Aegis Baseline (BL) 9.C2 (BMD 5.x) enhancements and Standard Missile SM-3 Block IIA operational testing.

- Working with the U.S. Navy Integrated Warfare System (IWS) Services' Operational Test Agencies (OTA), with the support of the Director of Operational Test and Evaluation (DOT&E), MDA has developed a test program to improve missile defense capabilities under development and ensure the capabilities transferred to the warfighter are operationally effective, suitable, and survivable.
- As part of MDA's rigorous test program, System Pre-Flight predictions provide confidence in test execution by predicting element performance and exercising element interfaces. System Post-Flight Reconstruction replicates the Ballistic Missile Defense System configuration and actual environmental conditions and target dynamics observed in flight to anchor Modeling and Simulation (M&S) results.
- The IMTP is event-oriented and extends until the collection of all identified data is completed ensuring adequate test investments.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Aegis BMD Flight Test Execution	103.981	10.447	71.351
Articles:	-	-	-
Description: Aegis BMD Flight Test Program performs comprehensive testing of Aegis BMD components and their interoperability with the BMDS using accredited M&S that provides the evidence required for the MDA and Combatant Commanders to transition the capability to the Operational Capacity Baseline. All flight testing is reflected in the R-4 schedule and the IMTP.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604878C / *Aegis BMD Test*	**Project (Number/Name)** MT09 / *AEGIS BMD Test*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Recurring Accomplishments include: -Prepare for and conduct BMDS Flight Test events as reflected in the IMTP and the R-4 schedule. -Collect Aegis BMD data for M&S anchoring used in comprehensive flight testing. -Conduct Aegis BMD specific analysis during pre- and post-mission analysis phases to confirm pre-mission predictions of mission success and validate post-test results. -Conduct test milestone reviews to ensure readiness for test execution and accomplishment of test objectives. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** SEE ABOVE. ***FY 2022 Plans:*** -SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides additional Layered Homeland Defense (LHLD) testing and Aegis BMD participation as aligned in the current IMTP.			
Title: Aegis BMD Ground Test Execution	17.059	23.060	18.405
Articles:	-	-	-
Description: Aegis BMD Ground Test (GT) Program performs comprehensive testing of Aegis BMD Components and their interoperability with the BMDS using accredited M&S that provides the evidence required for the MDA and Combatant Commanders to transition the capability to the Operational Capacity Baseline. More specifically, ground testing is used to collect data for Aegis BMD characterization and assessment, flight test risk reduction, and exploration of scenarios where flight testing is either impracticable or impossible. Recurring Accomplishments include: -Participate in BMD System GT to include pre-mission analysis, mission execution, and post-mission analysis. -Conduct planning to ensure Aegis Ashore Missile Defense Test Complex (AAMDTC), BMDS Test Bed San Diego (BTS), and Lockheed Martin Rotary and Mission Systems (LM-RMS) Computer Program Test Site (CPTS) capabilities support Aegis BMD testing, exercises, flight tests, and demonstration requirements. This includes upgrades to the ground testing labs to ensure compliance with operational and test baselines. -Continue testing of U.S. Navy Command, Control, Communications, Computers Intelligence (C4I) Systems and Aegis BMD baselines to ensure BMDS interoperability. -Continue to participate in System Level Ground Testing as an element of the layered BMDS to collect data for Aegis BMD characterization and assessment and exploration of scenarios where flight testing is either impracticable or impossible.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604878C / *Aegis BMD Test*	**Project (Number/Name)** MT09 / *AEGIS BMD Test*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Continue operation support of Hardware in the loop (HWIL) M&S for Element ground testing. -Aegis BMD HWIL lab participation align to the IMTP GT schedule and implementation of Future Ground Test Concept of Operations (CONOPS) pathfinders. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -SEE ABOVE. ***FY 2022 Plans:*** -SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects BMD participation as aligned in the current IMTP.			
Title: Aegis BMD Test Resources	18.996	14.194	10.460
Articles:	-	-	-
Description: This effort provides resources to conduct ground and flight testing to improve confidence in missile defense capabilities under development and ensure the capabilities transferred to the warfighter are operationally effective, suitable, and survivable. Recurring Accomplishments include: - Provide Core Test and Evaluation support for Aegis BMD test and evaluation missions and laboratories, field activities, range support activities, analysis activities, and shipboard and land-based test site test teams. - Provide Test & Evaluation (T&E) infrastructure support for Aegis BMD Test Missions as reflected in the IMTP to collect truth data for post-event analysis. - Exercise tactical communications during testing to ensure interoperability with the BMDS and Combatant Command (CCMD) systems. - Continue core test planning for Aegis BMD test missions to include assessment of target requirements, and preparation of the range to ensure all missions are executable and apply to the technical program objectives. - Develop and execute risk-reduction activities to minimize or mitigate shipboard and missile test and programs risks. - Develop and execute data collection plans and supporting instrumentation requirements. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** SEE ABOVE. ***FY 2022 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604878C / *Aegis BMD Test*	**Project (Number/Name)** MT09 / *AEGIS BMD Test*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects test resources in alignment with current IMTP changes.			
Title: Engineering & Analysis	13.481	9.116	5.927
Articles:	-	-	-
Description: Engineering & Analysis Description: The Engineering and Analysis effort provides essential MDS ground and flight test event planning, execution, and evaluation activities for each test event. Recurring Accomplishments: - Design test architecture, define test objectives and evaluation criteria, define target requirements, and generate ground and flight test scenarios appropriate to the data collection requirements to assess BMDS performance and anchor M&S. - Coordinate with Operational Test Agency (OTA) to address, coordinate, and disposition test issues to achieve closure through recommended action plans. - Deliver HWIL M&S integration test cases. - Conduct HWIL M&S integration benchmarking, and integrate the MDS HWIL M&S framework with MDA and non-MDA Elements into the test event MDS architecture. - Integrate, test, and deliver end-to-end MDS simulations supporting ground test missions. - Analyze System-level interoperability. - Conduct modeling and technical analysis for Combatant Command wargames and exercises. - Utilize M&S for pre-test assessment, post-test review, and M&S updates. - Provide test configuration management; risk assessments; and anomaly/deficiency review, assessment and closure. - Analyze test results to identify verification and validation data collection shortfalls and reassign objectives to future test events as required. - Document MDS test observations for system-level test anomalies and coordinate the resulting BMDS Discrepancy Reports within the Failure Reporting, Analysis, and Corrective Action System (FRACAS) - Provide the Quick Look Brief, Mission Data Review (MDR), and Executive MDR. - Provide long-range BMDS IMTP planning and integration strategies related to overarching BMDS analysis product integration. - Upgrade test analysis tools to enhance analysis capability and efficiency. - Populate the Modular Analysis and Reporting Suite (MARS) database with data from the most recently completed tests to support as-built analysis and capability assessments. - Provide engineering analysis process software, to include System Coordination and Observation Reporting Environment (SCORE), Software Change Analysis Review Environment (SCARE), File Manager (FileMan), and ManPower Loading (MPL). Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604878C / *Aegis BMD Test*	**Project (Number/Name)** MT09 / *AEGIS BMD Test*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
SEE ABOVE. ***FY 2022 Plans:*** -SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the current IMTP.			
Title: Test Program Operations	7.886	7.259	5.853
Articles:	-	-	-
Description: This activity funds the Government and contractor workforce that manage the overall Aegis Ballistic Missile Defense (BMD) program and enables the program to develop, build, and test standard missiles and the associated Aegis Weapon Systems. This project includes all operations support for the Aegis program office related to Engineering and Testing. ***FY 2021 Plans:*** SEE ABOVE. ***FY 2022 Plans:*** -SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects program office adjustments to align with current version of the IMTP.			
Accomplishments/Planned Programs Subtotals	161.403	64.076	111.996

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603892C: *AEGIS BMD*	722.582	877.336	732.512	-	732.512	-	-	-	-	-	-
• 0604880C: *Land Based SM-3 (LBSM3)*	36.918	56.628	43.158	-	43.158	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604878C / *Aegis BMD Test*	**Project (Number/Name)** MT09 / *AEGIS BMD Test*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Aegis BMD Flight Test Execution - Aegis BMD 5.x Development - MD09 - 20117142323680	MIPR	NSWC/DD : Dahlgren VA	0.000	2.179	Nov 2019	0.000		0.000		-		0.000	0.000	2.179	0.000
Aegis BMD Flight Test Execution - Aegis BMD 5.x Development - MD09 - 20117142323689	SS/CPAF	Lockheed Martin : Moorestown NJ	0.000	7.752	Nov 2019	0.000		0.000		-		0.000	0.000	7.752	0.000
Aegis BMD Flight Test Execution - Aegis BMD 5.x Development - MD09 - Various	MIPR	Various : MA, MD, VA, NJ	0.000	1.005	Nov 2019	0.000		0.000		-		0.000	0.000	1.005	0.000
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution	MIPR	Various - DT : HI,VA,CA,MA,NC	3.747	0.000		0.000		0.000		-		0.000	0.000	3.747	0.000
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - Flight Test Execution - ARMY- SMDC	MIPR	Army : SMDC	3.056	0.000		0.000		0.000		-		0.000	0.000	3.056	0.000
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - Flight Test Execution - DOT MARAD	MIPR	DOT : MARAD	13.193	0.000		0.500	Oct 2020	5.500	Dec 2021	-		5.500	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - Flight Test Execution - MT09 - SECOTEC	SS/CPFF	SECOTEC : Huntsville AL	2.887	0.000		0.300	Dec 2020	0.000		-		0.000	0.000	3.187	0.000
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09 - CPF	MIPR	COMPACTFLT : HI	1.630	4.703	Dec 2019	0.300	Dec 2020	2.160	Dec 2021	-		2.160	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD	SS/CPFF	Corvid : NC	4.568	2.058	Dec 2019	0.150	Dec 2020	0.180	Dec 2021	-		0.180	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604878C / *Aegis BMD Test*	**Project (Number/Name)** MT09 / *AEGIS BMD Test*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Flight Test Execution - MT09 - Corvid															
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09 -JHU/APL	SS/CPFF	JHU/APL : Columbia MD	19.606	6.200	Dec 2019	1.000	Dec 2020	10.000	Feb 2022	-		10.000	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09- Corona	MIPR	NSWC Corona : CA	13.712	5.173	Dec 2019	0.300	Dec 2020	7.520	Dec 2021	-		7.520	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09-DMEA	MIPR	DMEA : McClellan, CA	0.253	1.566	Dec 2019	0.700	Dec 2020	0.840	Dec 2021	-		0.840	0.000	3.359	0.000
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09-L3 Communications	C/CPFF	L3 Communications : Waco, TX	5.186	2.803	Dec 2019	0.300	Dec 2020	2.360	Dec 2021	-		2.360	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09-NAWC/AD	MIPR	NAWC/AD-PHX Air : Pax River, MD	7.850	2.273	Dec 2019	0.500	Dec 2020	2.160	Dec 2021	-		2.160	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09-NAWC/PM	MIPR	NAWC/PM : Pt. Mugu, CA	10.595	5.463	Dec 2019	0.500	Dec 2020	1.800	Dec 2021	-		1.800	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09-NRL	MIPR	Naval Research Lab : Washington, DC	0.255	0.890	Dec 2019	0.200	Dec 2020	0.240	Dec 2021	-		0.240	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09-NSWC DD	MIPR	NSWC Dahlgren : Dahlgren, VA	6.226	7.073	Dec 2019	0.500	Dec 2020	10.000	Dec 2021	-		10.000	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD	MIPR	NSWC Carderock : Potomac, MD	2.472	7.670	Dec 2019	0.650	Dec 2020	0.780	Dec 2021	-		0.780	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604878C / *Aegis BMD Test*	**Project (Number/Name)** MT09 / *AEGIS BMD Test*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Flight Test Execution - MT09-NSWCCR															
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09-PHD	MIPR	NSWC PHD : Pt. Hueneme, CA	13.577	8.300	Dec 2019	0.400	Dec 2020	5.127	Dec 2021	-		5.127	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09-PMRF	MIPR	PMRF Barking Sands : Kauai, HI	20.770	15.642	Dec 2019	0.000		3.500	Dec 2021	-		3.500	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09-SSCPAC	MIPR	SPAWAR : San Diego, CA	4.406	3.072	Dec 2019	0.750	Dec 2020	2.400	Dec 2021	-		2.400	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09-Various	MIPR	Various : HI, VA, CA, MA, NC, NJ, AZ	74.110	7.886	Dec 2019	0.000		5.000	Dec 2021	-		5.000	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Aegis BMD Flight Test Execution - MT09-Xontech	C/CPFF	Northrop Grumman System Corp : Huntsville, AL	1.505	1.656	Dec 2019	0.450	Dec 2020	0.540	Dec 2021	-		0.540	Continuing	Continuing	Continuing
Aegis BMD Flight Test Execution - Flight Test Execution	SS/CPFF	Lockheed Martin : NJ	14.779	0.000		2.947	Dec 2020	6.000	Dec 2021	-		6.000	0.000	23.726	0.000
Aegis BMD Flight Test Execution - Flight Test Execution - RMS	SS/CPFF	Raytheon : AZ	9.494	0.000		0.000		5.244	Dec 2021	-		5.244	0.000	14.738	0.000
Aegis BMD Flight Test Execution - Standard Missile - 3 (SM-3) Block IIA Development - Block IIA Flight Test Support - Various	MIPR	Various : CA, VA, MD	0.000	1.100	Nov 2019	0.000		0.000		-		0.000	0.000	1.100	0.000
Aegis BMD Flight Test Execution - Standard	SS/CPIF	Raytheon : Tucson AZ	0.000	8.017	Apr 2020	0.000		0.000		-		0.000	0.000	8.017	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604878C / *Aegis BMD Test*	**Project (Number/Name)** MT09 / *AEGIS BMD Test*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Missile - 3 (SM-3) Block IIA Development - MT09 - SM-3 BLK IIA Flight Test Support															
Aegis BMD Flight Test Execution - Standard Missile - 3 (SM-3) Block IIA Development - MT09 - SM-3 BLK IIA Flight Test Support - DD	MIPR	NSWC DD : Dahlgren VA	0.000	0.500	Nov 2019	0.000		0.000		-		0.000	0.000	0.500	0.000
Aegis BMD Flight Test Execution - Standard Missile - 3 (SM-3) Block IIA Development - MT09 - SM-3 BLK IIA Flight Test Support APL	MIPR	JHU/APL : Laurel MD	0.000	1.000	Dec 2019	0.000		0.000		-		0.000	0.000	1.000	0.000
Aegis BMD Ground Test Execution - Aegis BMD Ground Test Execution - Aegis BMD Ground Test Execution - MT09 - NSWCDD	MIPR	NSWC : Dahlgren VA	1.954	0.000		2.100	Dec 2020	0.000		-		0.000	0.000	4.054	0.000
Aegis BMD Ground Test Execution - Aegis BMD Ground Test Execution - Aegis BMD Ground Test Execution - MT09 -Navy	MIPR	PEO : IWS	0.302	0.000		0.000		0.000		-		0.000	0.000	0.302	0.000
Aegis BMD Ground Test Execution - Aegis BMD Ground Test Execution - MT09 - CORONA	MIPR	NSWC Corona : CA	3.579	1.982	Dec 2019	0.602	Dec 2020	0.730	Dec 2021	-		0.730	Continuing	Continuing	Continuing
Aegis BMD Ground Test Execution - Aegis BMD Ground Test Execution - MT09 - JHU/APL MDA	SS/CPFF	JHU/APL : MDA	6.555	2.480	Dec 2019	4.200	Dec 2020	3.211	Dec 2021	-		3.211	Continuing	Continuing	Continuing
Aegis BMD Ground Test Execution - Aegis BMD	SS/CPFF	Lockheed Martin : Moorestown, NJ	29.545	3.731	Dec 2019	6.900	Dec 2020	5.900	Dec 2021	-		5.900	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604878C / *Aegis BMD Test*	Project (Number/Name) MT09 / *AEGIS BMD Test*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ground Test Execution - MT09 - LM															
Aegis BMD Ground Test Execution - Aegis BMD Ground Test Execution - MT09 - PHD	MIPR	NSWC PHD : Pt. Hueneme, CA	4.152	3.156	Dec 2019	2.500	Dec 2020	1.800	Dec 2021	-		1.800	Continuing	Continuing	Continuing
Aegis BMD Ground Test Execution - Aegis BMD Ground Test Execution - MT09 - SSCPAC	MIPR	SPAWAR : San Diego, CA	22.741	5.710	Dec 2019	6.758	Dec 2020	6.764	Dec 2021	-		6.764	Continuing	Continuing	Continuing
Aegis BMD Test Resources - Aegis BMD Test Resources - DT - Various	MIPR	Various : HI, VA, CA, MA, MD	0.587	0.000		0.000		0.000		-		0.000	0.000	0.587	0.000
Aegis BMD Test Resources - Aegis BMD Test Resources - MT09 - APL	SS/CPFF	JHU/APL : Columbia MD	33.441	3.207	Dec 2019	2.500	Dec 2020	1.000	Dec 2021	-		1.000	Continuing	Continuing	Continuing
Aegis BMD Test Resources - Aegis BMD Test Resources - MT09 - Aegis	MIPR	Aegis BMD : VA	2.371	0.000		0.000		0.000		-		0.000	0.000	2.371	0.000
Aegis BMD Test Resources - Aegis BMD Test Resources - MT09 - CORONA	MIPR	NSWC Corona : CA	20.433	4.600	Dec 2019	4.300	Dec 2020	4.500	Dec 2021	-		4.500	Continuing	Continuing	Continuing
Aegis BMD Test Resources - Aegis BMD Test Resources - MT09 - NAWC/PM	MIPR	NAWC/PM : Pt. Mugu, CA	3.545	0.000		0.850	Dec 2020	1.000	Dec 2021	-		1.000	Continuing	Continuing	Continuing
Aegis BMD Test Resources - Aegis BMD Test Resources - MT09 - NSWCDD	MIPR	NSWC Dahlgren : Dahlgren, VA	15.072	1.917	Dec 2019	0.940	Dec 2020	0.928	Dec 2021	-		0.928	Continuing	Continuing	Continuing
Aegis BMD Test Resources - Aegis BMD	MIPR	NSWC PHD : Pt. Hueneme, CA	24.870	3.248	Dec 2019	4.870	Dec 2020	2.000	Dec 2021	-		2.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604878C / *Aegis BMD Test*	Project (Number/Name) MT09 / *AEGIS BMD Test*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Resources - MT09 - PHD															
Aegis BMD Test Resources - Aegis BMD Test Resources - MT09 - PMRF	MIPR	PMRF Barking Sands : Kauai, HI	2.975	0.291	Dec 2019	0.150	Dec 2020	0.000		-		0.000	0.000	3.416	0.000
Aegis BMD Test Resources - Aegis BMD Test Resources - MT09 - SSCPAC	MIPR	SPAWAR : San Diego, CA	9.032	1.089	Dec 2019	0.149	Dec 2020	0.100	Dec 2021	-		0.100	Continuing	Continuing	Continuing
Aegis BMD Test Resources - Aegis BMD Test Resources - MT09 - Various	MIPR	Various : HI, VA, CA, MA, MD	18.554	4.644	Dec 2019	0.435	Dec 2020	0.932	Dec 2021	-		0.932	Continuing	Continuing	Continuing
Engineering & Analysis - Engineering & Analysis	TBD	Teledyne Brown Engineering : Huntsville ,AL	0.000	4.500	Nov 2019	1.050	Nov 2020	1.672	Nov 2021	-		1.672	Continuing	Continuing	Continuing
Engineering & Analysis - Engineering & Analysis - Engineering & Analysis - Engineering Support	C/CPAF	Northrop Grumman : AL, CO	8.201	0.000		0.000		0.000		-		0.000	0.000	8.201	0.000
Engineering & Analysis - Engineering & Analysis - Engineering & Analysis - FFRDC/UARC	MIPR	Various : AL, CO, VA	17.029	0.000		0.000		0.000		-		0.000	0.000	17.029	0.000
Engineering & Analysis - Engineering & Analysis - Engineering & Analysis - Industry	C/CPAF	Boeing : AL	3.696	0.000		0.000		0.000		-		0.000	0.000	3.696	0.000
Engineering & Analysis - Engineering & Analysis - Engineering & Analysis - OGA	MIPR	CCDC : AL	26.295	2.065	Nov 2019	1.831	Nov 2020	1.442	Nov 2021	-		1.442	Continuing	Continuing	Continuing
Engineering & Analysis - Engineering & Analysis - NME	MIPR	CCDC : CO, AL	0.500	5.387	Nov 2019	4.492	Nov 2020	0.250	Nov 2021	-		0.250	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604878C / *Aegis BMD Test*	**Project (Number/Name)** MT09 / *AEGIS BMD Test*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering & Analysis - Engineering & Analysis NME Support	MIPR	SPAWAR : CA	2.876	0.000		0.000		0.000		-		0.000	0.000	2.876	0.000
Engineering & Analysis - Engineering & Analysis- Various	MIPR	GTRI : Huntsville, AL	0.000	1.529	Nov 2019	1.743	Nov 2020	2.563	Nov 2021	-		2.563	Continuing	Continuing	Continuing
Test Program Operations - Program Operations - MT09 - Civ Salary	Allot	MDA : Dahlgren, VA	1.602	2.344	Nov 2019	1.683	Dec 2020	1.551	Dec 2021	-		1.551	Continuing	Continuing	Continuing
Test Program Operations - Program Operations - MT09 - MDA Travel	Allot	MDA : Dahlgren, VA	0.776	0.538	Nov 2019	0.766	Dec 2020	0.353	Dec 2021	-		0.353	Continuing	Continuing	Continuing
Test Program Operations - Program Operations - MT09 - NAVSEA Civ Sal	MIPR	NAVSEA : Washington DC	0.736	0.434	Nov 2019	1.391	Dec 2020	0.540	Dec 2021	-		0.540	Continuing	Continuing	Continuing
Test Program Operations - Program Operations - MT09 - TEAMS	MIPR	Various : Various	0.000	0.000		0.000		3.409	Dec 2021	-		3.409	Continuing	Continuing	Continuing
		Subtotal	495.296	156.833		60.657		111.996		-		111.996	Continuing	Continuing	N/A

Remarks

N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Program Operations - Program Operations - MT09 - MIDAESS	C/CPFF	Various : Various	4.454	4.570	Nov 2019	3.419	Dec 2020	0.000		-		0.000	0.000	12.443	0.000
		Subtotal	4.454	4.570		3.419		0.000		-		0.000	0.000	12.443	N/A

Remarks

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604878C / *Aegis BMD Test*	Project (Number/Name) MT09 / *AEGIS BMD Test*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	499.750	161.403		64.076		111.996		-		111.996	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604878C / *Aegis BMD Test*	**Project (Number/Name)** MT09 / *AEGIS BMD Test*

Significant Event Complete ▲ | Significant Event Planned △ | Milestone Decision Complete ★ | Milestone Decision Planned ☆ | Element Test Complete ◆ | Element Test Planned ◇ | System Level Test Complete ● | System Level Test Planned ○ | Complete Activity ✦ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
GTI-07c (N/I) (MDS Ground Test)	✦																											
FTM-44 SMPT	✦																											
GTI-20 Sprint 1(E/C) (MDS Ground Test)		✦																										
FTM-44 (AEGIS 5.1, DT Intercept Flight Test)					▲																							
GTI-21 Sprint 1 (JEON) TH 4.0 (MDS Ground Test)						✧	✧																					
FS-21 E1 (AEGIS 5.1, DT Interceptor Only Flight Test)							△																					
GTI-ISR (21) (MDS Ground Test)									✧																			
GTI-09 Sprint 1 (E/C) (MDS Ground Test)									✧																			
GTD-08a (N/I) (MDS Ground Test)										✧																		
FTM-46 (AEGIS 5.0, DT/OT Intercept Flight Test)										△																		
GTI-09 Sprint 2 (E/C) (MDS Ground Test)										✧	✧																	
GTI-08b Sprint 1 (N/I) (MDS Ground Test)											✧																	
FTX-26 (OT) (SN, OT Target Only Flight Test)												△																
GTD-09 (E/C) (MDS Ground Test)												✧																
PACIFIC DRAGON-22 E1 (AEGIS 5.0, DT/OT Intercept Flight Test)												△																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604878C / *Aegis BMD Test*	**Project (Number/Name)** MT09 / *AEGIS BMD Test*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
GTI-07c (N/I) (MDS Ground Test)	1	2020	1	2020
FTM-44 SMPT	1	2020	1	2020
GTI-20 Sprint 1(E/C) (MDS Ground Test)	2	2020	2	2020
FTM-44 (AEGIS 5.1, DT Intercept Flight Test)	1	2021	1	2021
GTI-21 Sprint 1 (JEON) TH 4.0 (MDS Ground Test)	2	2021	3	2021
FS-21 E1 (AEGIS 5.1, DT Interceptor Only Flight Test)	3	2021	3	2021
GTI-ISR (21) (MDS Ground Test)	1	2022	1	2022
GTI-09 Sprint 1 (E/C) (MDS Ground Test)	1	2022	1	2022
GTD-08a (N/I) (MDS Ground Test)	2	2022	2	2022
FTM-46 (AEGIS 5.0, DT/OT Intercept Flight Test)	2	2022	2	2022
GTI-09 Sprint 2 (E/C) (MDS Ground Test)	2	2022	3	2022
GTI-08b Sprint 1 (N/I) (MDS Ground Test)	3	2022	3	2022
FTX-26 (OT) (SN, OT Target Only Flight Test)	4	2022	4	2022
GTD-09 (E/C) (MDS Ground Test)	4	2022	4	2022
PACIFIC DRAGON-22 E1 (AEGIS 5.0, DT/OT Intercept Flight Test)	4	2022	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604878C / *Aegis BMD Test*	Project (Number/Name) MD40 / *Program Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program Wide Support*	18.688	5.961	6.788	5.059	-	5.059	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	5.961	6.788	5.059
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the STEM program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; the FSRM program (formerly Real Property Maintenance) to keep the Department's			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604878C / *Aegis BMD Test*	**Project (Number/Name)** MD40 / *Program Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the PWS allocation on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.			
Accomplishments/Planned Programs Subtotals	5.961	6.788	5.059

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604878C / *Aegis BMD Test*	**Project (Number/Name)** MD40 / *Program Wide Support*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Operations Management	Allot	Various : Multi: AL, VA	0.694	0.089	Jul 2020	0.150	Jul 2021	0.175	Jan 2022	-		0.175	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations User Services	C/CPAF	Various : Multi: AL, CA, CO, VA	0.000	0.324	Dec 2019	0.000		0.000		-		0.000	0.000	0.324	0.000
Program Wide Support - Agency Operations and Support Civilian Salaries, Travel, Training	Allot	Various : MDA Multi: AL, CO, CA, VA,	10.761	0.000		0.000		0.000		-		0.000	0.000	10.761	0.000
Program Wide Support - Agency Operations and Support Other Agency Services (FFP)	C/FFP	Various : Multi: AL, CA, CO, VA	7.178	5.548	Apr 2020	6.035	Apr 2021	4.274	Feb 2022	-		4.274	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Other Agency Services (MIPR)	MIPR	Various : Multi: AL, CA, CO, VA	0.055	0.000		0.603	Oct 2020	0.610	Oct 2021	-		0.610	Continuing	Continuing	Continuing
		Subtotal	18.688	5.961		6.788		5.059		-		5.059	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	18.688	5.961		6.788		5.059		-		5.059	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604878C / *Aegis BMD Test*	**Project (Number/Name)** MD40 / *Program Wide Support*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604878C / *Aegis BMD Test*	**Project (Number/Name)** MD40 / *Program Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

THIS PAGE INTENTIONALLY LEFT BLANK

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 0604879C *I Ballistic Missile Defense Sensor Test*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	373.696	96.082	64.245	77.428	-	77.428	-	-	-	-	-	-
MT11: *BMDS Radars Test*	357.027	91.605	61.208	74.272	-	74.272	-	-	-	-	-	-
MD40: *Program Wide Support*	16.669	4.477	3.037	3.156	-	3.156	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

Increase from FY 2021 to FY 2022 is in accordance with the current Integrated Master Test Plan (IMTP).

A. Mission Description and Budget Item Justification

MDA Sensors executes a robust test program that includes flight and ground tests to support both strategic and regional Missile Defense System (MDS) capabilities against medium- and long-range threats. The Sensors elements of the MDS Integrated Master Test Plan (IMTP) are intended to demonstrate the integrated missile defense capabilities under development to ensure the capabilities delivered to the Warfighter are operationally effective, suitable, and survivable. The Sensors Test Program Element specifically includes the planning, execution, and analysis of flight and ground tests, as well as the associated infrastructure to provide data required for Missile Defense technical Capability Declarations.

The Sensors Test program supports integration of radar improvements into the MDS, mid and far-term Discrimination Improvements, and Operational Test and Evaluation of the theater/regional and strategic MDS architecture.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	105.530	76.456	99.138	-	99.138
Current President's Budget	96.082	64.245	77.428	-	77.428
Total Adjustments	-9.448	-12.211	-21.710	-	-21.710
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	-12.211			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	-9.448	0.000	-21.710	-	-21.710

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0604879C *I Ballistic Missile Defense Sensor Test*

Change Summary Explanation

Decrease in FY 2020 reflects realignment of Agency funding from MDS Sensor Test (0604879C) to Sea Based X-Band Radar (0603907C) to initiate SBX Radome Replacement.

Decrease in FY 2021 reflects Congressional reduction for prior year test asset carryover.

Decrease in FY 2022 is in accordance with the current Integrated Master Test Plan (IMTP).

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604879C / *Ballistic Missile Defense Sensor Test*	Project (Number/Name) MT11 / *BMDS Radars Test*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MT11: *BMDS Radars Test*	357.027	91.605	61.208	74.272	-	74.272	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Increase from FY 2021 to FY 2022 is in accordance with the current Integrated Master Test Plan (IMTP).

A. Mission Description and Budget Item Justification

This project provides activities for planning, analysis, and execution of BMDS flight test events, including pre- and post-test ground testing such as Digital and Hardware-in-the-Loop (HWIL) System Pre-Mission Tests (SPMTs) and System Post-Flight Reconstruction (SPFR). Sensors Test provides planning, analysis, and execution in accordance with the Ground Test Concept of Operations (CONOPS) supporting the Ground Test level of effort concept for MDS system level ground tests identified in the IMTP. Test infrastructure funding provides for HWIL labs, Mission Operation Center/Mission Support Center (MOC/MSC), and program management required to operate and maintain a flight and ground test capability.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Test Resources	26.313	54.594	65.569
Articles:	-	-	-
Description: Test Resources efforts include configuration and maintenance of Sensors HWILs for use in ground test execution (MDS testing and element interoperability developmental testing) and in MDS flight test execution pre-mission testing, and technical oversight to all MDS system level activities with Sensors participation. It also includes conducting the detailed test event planning and design, integration, and execution for all MDS ground test campaigns. Test Resources provides support for evolving Objective Simulation Framework (OSF) (software upgrades) integration into the MDS HWIL ground test execution and flight test execution. Beginning in FY 2021, it also provides a Level of Effort (LOE) support to MDS Ground Tests in accordance with the MDS Integrated Master Test Plan (IMTP) and the new Ground Test Concept of Operations (CONOPS). Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE ***FY 2022 Plans:*** - SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604879C / *Ballistic Missile Defense Sensor Test*	**Project (Number/Name)** MT11 / *BMDS Radars Test*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Increase from FY 2021 to FY 2022 is in accordance with the current Integrated Master Test Plan (IMTP).			
Title: Flight Test Execution	33.482	6.614	8.703
Articles:	-	-	-
Description: Flight Test Execution includes test planning, pre-flight analysis, transportation of radars and MOC/MSC, test execution, and post-flight analysis for Sensors' participation in MDS flight tests in accordance with the MDS IMTP. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE ***FY 2022 Plans:*** - SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 is in accordance with the current Integrated Master Test Plan (IMTP).			
Title: Ground Test Execution	31.810	0.000	0.000
Articles:	-	-	-
Description: Ground Test Execution includes event planning, asset integration, execution, and post-mission analysis for Sensors' participation in MDS ground tests in accordance with the MDS IMTP. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -N/A ***FY 2022 Plans:*** -N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	91.605	61.208	74.272

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604879C / *Ballistic Missile Defense Sensor Test*	**Project (Number/Name)** MT11 / *BMDS Radars Test*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603884C: *Ballistic Missile Defense Sensors*	348.356	265.803	224.750	-	224.750	-	-	-	-	-	-
• 0603896C: *Ballistic Missile Defense Command and Control, Battle Management & Communication*	550.513	645.741	603.448	-	603.448	-	-	-	-	-	-
• 0603898C: *Ballistic Missile Defense Joint Warfighter Support*	51.095	49.560	50.594	-	50.594	-	-	-	-	-	-
• 0603904C: *Missile Defense Integration and Operations Center (MDIOC)*	54.783	55.356	52.403	-	52.403	-	-	-	-	-	-
• 0603907C: *Sea Based X-Band Radar (SBX)*	137.604	118.318	147.241	-	147.241	-	-	-	-	-	-
• 0603914C: *Ballistic Missile Defense Test*	398.939	365.208	362.906	-	362.906	-	-	-	-	-	-
• 0604672C: *Homeland Defense Radar-Hawaii*	181.569	133.000	0.000	-	0.000	-	-	-	-	-	-
• 0604673C: *Pacific Discriminating Radar*	2.921	0.000	0.000	-	0.000	-	-	-	-	-	-
• 0604873C: *Long Range Discrimination Radar (LRDR)*	131.135	138.317	133.335	-	133.335	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

Test & Evaluation projects use multiple existing development and MDS test contracts depending on the system(s) involved in the testing.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604879C / *Ballistic Missile Defense Sensor Test*	**Project (Number/Name)** MT11 / *BMDS Radars Test*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Resources - AN/ TPY-2, SBX, UEWR & CD OSF Integration & Infrastructure, Sys Test Lab	C/CPAF	Raytheon : MA	65.889	14.513	Nov 2019	30.932	Nov 2020	37.393	Nov 2021	-		37.393	Continuing	Continuing	Continuing
Test Resources - Civilians/ Travel	Allot	MDA : AL/VA	0.000	4.435	Oct 2019	5.640	Oct 2020	4.415	Oct 2021	-		4.415	Continuing	Continuing	Continuing
Test Resources - Communications Development - OGA	MIPR	Secretary of the Air Force (SAF) : NCR	0.000	1.516	Jan 2020	0.000		0.000		-		0.000	0.000	1.516	0.000
Test Resources - Contract Support Services	Various	Various : Various	0.000	3.668	Oct 2019	3.616	Oct 2020	3.682	Oct 2021	-		3.682	Continuing	Continuing	Continuing
Test Resources - Cyber Win10 Implementation - MDDC Lab Analysis Infrastructure	C/IDIQ	Analytical Services, Inc. : AL	0.825	0.000		0.000		0.000		-		0.000	0.000	0.825	0.000
Test Resources - Cybersecurity - BGTC and SBIRS	C/IDIQ	Northrop Grumman Space & Mission System : CO	1.600	0.000		0.000		0.000		-		0.000	0.000	1.600	0.000
Test Resources - Cybersecurity - Tactical Communication Environment Segment (TCES)	MIPR	SPAWAR : CA	0.190	0.000		0.000		0.000		-		0.000	0.000	0.190	0.000
Test Resources - General Infrastructure and OGA Support	Various	Various : AL, NM	3.293	0.000		4.471	Nov 2020	6.983	Nov 2021	-		6.983	Continuing	Continuing	Continuing
Test Resources - LRDR OSF Integration & Infrastructure, Sys Test Lab	C/CPFF	Lockheed Martin : NJ	1.380	2.181	Jan 2020	9.935	Nov 2020	13.096	Nov 2021	-		13.096	Continuing	Continuing	Continuing
Test Resources - UEWR SSF Integration &	C/FPIF	deciBel : AL	14.655	0.000		0.000		0.000		-		0.000	0.000	14.655	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604879C / *Ballistic Missile Defense Sensor Test*	Project (Number/Name) MT11 / *BMDS Radars Test*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Infrastructure, Sys Test Lab															
Flight Test Execution - AN/TPY-2, SBX UEWR & CD MDS Level Testing	C/CPAF	Raytheon : MA	124.570	2.453	Mar 2020	2.410	Mar 2021	3.284	Nov 2021	-		3.284	Continuing	Continuing	Continuing
Flight Test Execution - Agency Level Testing Support	C/CPAF	L-3 Communications : AL	0.000	17.000	Jan 2020	0.000		0.000		-		0.000	0.000	17.000	0.000
Flight Test Execution - FT Security, Site Activation & Deployments MDS Level Testing	Various	Various : AI, CO, HI, Wake Island	33.471	7.807	Oct 2019	0.000		0.000		-		0.000	0.000	41.278	0.000
Flight Test Execution - LRDR MDS Level Testing	SS/TBD	Lockheed Martin : NJ	0.032	4.956	Sep 2020	4.204	Sep 2021	5.419	Nov 2021	-		5.419	Continuing	Continuing	Continuing
Flight Test Execution - OGA Sensor Research & Development	MIPR	Secretary of the Air Force : NCR	4.500	0.000		0.000		0.000		-		0.000	0.000	4.500	0.000
Flight Test Execution - System-Level Post Flight Reconstruction (SPFR)	MIPR	CCDC AVMC : AL	1.470	1.266	Jun 2020	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Flight Test Execution - UEWR/CD MDS Level Testing	C/FPIF	deciBel : AL	1.152	0.000		0.000		0.000		-		0.000	0.000	1.152	0.000
Ground Test Execution - AN/TPY-2, SBX, UEWR/CD MDS Level Testing	C/CPAF	Raytheon : MA	104.000	21.324	Feb 2020	0.000		0.000		-		0.000	0.000	125.324	0.000
Ground Test Execution - Long Range Discrimination MDS Level Testing	C/CPFF	Lockheed Martin : NJ	0.000	10.486	Oct 2019	0.000		0.000		-		0.000	0.000	10.486	0.000
		Subtotal	357.027	91.605		61.208		74.272		-		74.272	Continuing	Continuing	N/A

Remarks

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604879C / *Ballistic Missile Defense Sensor Test*	Project (Number/Name) MT11 / *BMDS Radars Test*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	357.027	91.605		61.208		74.272		-		74.272	Continuing	Continuing	N/A

Remarks

Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604879C / *Ballistic Missile Defense Sensor Test*	**Project (Number/Name)** MT11 / *BMDS Radars Test*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
GTI-07c (N/I) (MDS Ground Test)	✦																											
GTI-20 Sprint 1(E/C) (MDS Ground Test)		✦																										
GTI-20 Sprint 2 (JEON) (MDS Ground Test)			✦																									
Site 4c SICO (MDS Ground Test)				✦																								
GTI-08a (N/I) (MDS Ground Test)				✧	✧	✧	✧	✧																				
FTM-44 (AEGIS 5.1, DT Intercept Flight Test)					▲																							
GTI-21 Sprint 1 (JEON) TH 4.0 (MDS Ground Test)						✧	✧																					
FTX-43 (OTHER, DT Tracking Exercise Flight Test)							△																					
TH CTV-01 (LTPO, DT Interceptor Only Flight Test)								△																				
FTT-21 (TH, DT Intercept Flight Test)								△																				
SM CTV-04 (AEGIS 5.1, DT Interceptor Only Flight Test)								△																				
GTI-ISR (21) (MDS Ground Test)									✧																			
GTI-09 Sprint 1 (E/C) (MDS Ground Test)									✧																			
GTD-08a (N/I) (MDS Ground Test)										✧																		
GTI-09 Sprint 2 (E/C) (MDS Ground Test)										✧	✧																	
GTI-08b Sprint 1 (N/I) (MDS Ground Test)											✧																	
FTX-26 (OT) (SN, OT Target Only Flight Test)												△																
GTD-09 (E/C) (MDS Ground Test)												✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604879C / *Ballistic Missile Defense Sensor Test*	**Project (Number/Name)** MT11 / *BMDS Radars Test*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
GTI-07c (N/I) (MDS Ground Test)	1	2020	1	2020
GTI-20 Sprint 1(E/C) (MDS Ground Test)	2	2020	2	2020
GTI-20 Sprint 2 (JEON) (MDS Ground Test)	3	2020	3	2020
Site 4c SICO (MDS Ground Test)	4	2020	4	2020
GTI-08a (N/I) (MDS Ground Test)	4	2020	4	2021
FTM-44 (AEGIS 5.1, DT Intercept Flight Test)	1	2021	1	2021
GTI-21 Sprint 1 (JEON) TH 4.0 (MDS Ground Test)	2	2021	3	2021
FTX-43 (OTHER, DT Tracking Exercise Flight Test)	3	2021	3	2021
TH CTV-01 (LTPO, DT Interceptor Only Flight Test)	4	2021	4	2021
FTT-21 (TH, DT Intercept Flight Test)	4	2021	4	2021
SM CTV-04 (AEGIS 5.1, DT Interceptor Only Flight Test)	4	2021	4	2021
GTI-ISR (21) (MDS Ground Test)	1	2022	1	2022
GTI-09 Sprint 1 (E/C) (MDS Ground Test)	1	2022	1	2022
GTD-08a (N/I) (MDS Ground Test)	2	2022	2	2022
GTI-09 Sprint 2 (E/C) (MDS Ground Test)	2	2022	3	2022
GTI-08b Sprint 1 (N/I) (MDS Ground Test)	3	2022	3	2022
FTX-26 (OT) (SN, OT Target Only Flight Test)	4	2022	4	2022
GTD-09 (E/C) (MDS Ground Test)	4	2022	4	2022

Note

FY 2020 Joint Emerging Operational Needs (JEON) tests are funded in Program Element (PE) 0603914C BMD Test. Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604879C / *Ballistic Missile Defense Sensor Test*	Project (Number/Name) MD40 / *Program Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program Wide Support*	16.669	4.477	3.037	3.156	-	3.156	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	4.477	3.037	3.156
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment,			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604879C / *Ballistic Missile Defense Sensor Test*	**Project (Number/Name)** MD40 / *Program Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	4.477	3.037	3.156

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604879C / *Ballistic Missile Defense Sensor Test*	**Project (Number/Name)** MD40 / *Program Wide Support*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Operations Management	Various	Various : Multi: AL, VA	2.192	0.067	Jul 2020	0.092	Jul 2021	0.112	Apr 2022	-		0.112	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	MIPR	Various : Multi: AL, VA	14.477	4.410	Jul 2020	2.945	Jul 2021	3.044	Apr 2022	-		3.044	Continuing	Continuing	Continuing
		Subtotal	16.669	4.477		3.037		3.156		-		3.156	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	16.669	4.477		3.037		3.156		-		3.156	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604879C / *Ballistic Missile Defense Sensor Test*	**Project (Number/Name)** MD40 / *Program Wide Support*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604879C / *Ballistic Missile Defense Sensor Test*	**Project (Number/Name)** MD40 / *Program Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

THIS PAGE INTENTIONALLY LEFT BLANK

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 0604880C *I Land Based SM-3 (LBSM3)*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	1,188.051	36.918	56.628	43.158	-	43.158	-	-	-	-	-	-
MD68: *AEGIS Ashore*	1,141.008	32.922	51.764	39.594	-	39.594	-	-	-	-	-	-
MC68: *Cyber Operations*	5.625	2.365	2.615	0.944	-	0.944	-	-	-	-	-	-
MD40: *Program-Wide Support*	41.418	1.631	2.249	2.620	-	2.620	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

Decrease from FY 2021 to FY 2022 reflects the following:

- Continued program maturation of Site Activation activities as Poland construction nears completion and the Integrated Electrical Security System (IESS) becomes fully operational
- Nearing completion of Aegis Combat System component upgrades and improvements at the Aegis Ashore Missile Defense Test Complex (AAMDTC)

A. Mission Description and Budget Item Justification

This program supports development of the Land-Based Standard Missile-3 (LBSM3) capability, Aegis Ashore. On 17 September 2009, the President announced an overarching plan to provide regional missile defense to U.S. deployed forces, allies, and partners in Europe called the European Phased Adaptive Approach (EPAA). The EPAA policy specifically defines a timeline to deploy a mix of afloat and land-based Ballistic Missile Defense (BMD) capabilities. Aegis Ashore represents one of these land-based capabilities. The U.S. can also build on current efforts to pursue Phased Adaptive Approaches (PAAs) in the Asia Pacific and the Middle East regions. The PAA tailors U.S. BMD capabilities to specific theater needs enhancing integrated regional missile defenses to protect defended assets against medium, intermediate, and ultimately intercontinental range ballistic missiles.

Aegis Ashore is a key component of EPAA Phases II (Romania) and III (Poland) and provides Aegis BMD capability against short to intermediate-range ballistic missiles in an ashore configuration. Aegis Ashore provides sophisticated engagement strategies and can adapt to threat updates while also being deployed/redeployed worldwide where needed to provide persistent coverage for the Geographic Combatant Commanders. Aegis Ashore re-hosts the required BMD components of a U.S. Navy Destroyer, including: SPY-1 Radio Direction and Ranging (Radar); Vertical Launch System (VLS), Computing Infrastructure; Command Control; Communications; Computers and Intelligence (C4I) Systems; and Operator Consoles.

This program element will continue to modernize, develop, and test Aegis Ashore capability improvements at the AAMDTC in Hawaii for implementation at operational sites.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0604880C *I Land Based SM-3 (LBSM3)*

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	38.352	56.628	43.742	-	43.742
Current President's Budget	36.918	56.628	43.158	-	43.158
Total Adjustments	-1.434	0.000	-0.584	-	-0.584
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.942	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	-0.492	0.000	-0.584	-	-0.584

Change Summary Explanation

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604880C / *Land Based SM-3 (LBSM3)*	Project (Number/Name) MD68 / *AEGIS Ashore*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD68: *AEGIS Ashore*	1,141.008	32.922	51.764	39.594	-	39.594	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2021 to FY 2022 reflects the following:

- Continued program maturation for Site Activation activities as Poland construction nears completion and the Integrated Electrical Security System (IESS) becomes fully operational
- Nearing completion of Aegis Combat System component upgrades and improvements at the AAMDTC

A. Mission Description and Budget Item Justification

Deployed sites, referred to as Aegis Ashore Missile Defense Systems (AAMDS), will be modified to support future computer programs and missile variants in step with the U.S. Navy's Destroyer Modernization Plan. MDA is responsible for maintaining and modernizing the test center at the Pacific Missile Range Facility (PMRF), while the U.S. Navy is responsible for maintaining and modernizing all deployed Aegis Ashore sites. The initial AAMDS deployed to Romania in 2015 employing Aegis BMD 5.0 CU (Capabilities Upgrade) and SM-3 Block IB. A second AAMDS will deploy to Poland and is scheduled to become operational in FY 2022. These sites provide an Aegis Ashore exo-atmospheric defense against short to intermediate-range ballistic missile threats in the later stages of flight. If the threat dictates, additional systems can be purchased and deployed globally.

Research and Development efforts include design of modifications to adapt the Aegis Weapon System for land-based use, modernization in pace with the U.S. Navy's Destroyer Modernization Plan, development and testing of Aegis Ashore capability improvements at the AAMDTC in Hawaii, and modifications, as required, to enhance co-existence with Broadband Wireless Access systems in the European theater.

In support of EPAA Phase III, Aegis Ashore integrates the Aegis BMD 5.1 and Standard Missile (SM-3) Block IIA capabilities into the Aegis Ashore sites. MDA will provide all upgrades to BMD capability, BMD specific mission equipment, and integration with existing Missile Defense System (MDS) nodes for all Aegis Ashore sites.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Aegis Weapon System Development	19.015	27.889	22.107
Articles:	-	-	-
Description: Operate, maintain and upgrade the AAMDTC at the PMRF in Hawaii. Develop and test Aegis Ballistic Missile Defense (BMD) capability improvements, and support advanced radar and combat system studies and engineering analysis to achieve compliance with the MDA's High Altitude Electromagnetic Pulse (HEMP) Technical Performance Measure requirement and subsequent Defense Threat Reduction Agency (DTRA)/ United States Strategic Command/ European Command (EUCOM) certification.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604880C / *Land Based SM-3 (LBSM3)*	**Project (Number/Name)** MD68 / *AEGIS Ashore*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Recurring Accomplishments: - Determine the minimum hardware refresh of element components and spares that are projected to be removed from the production to ensure the test capability at AAMDTC remains current with the U.S Navy's Destroyer Modernization efforts - Provide system engineering, technical, and logistics support for the AAMDS facility and tactical elements to ensure appropriate system adaptation, readiness, availability, and effectiveness - Modernize the AAMDTC Weapons System, C4I, VLS, and other equipment to align with the U.S. Navy's Destroyer Modernization Plan and ensure the test site configuration is ready to support MDS testing - Maintain Aegis Ashore Technical Data Package with modernization implementation to include drawings and installation plans for U.S. Navy use in implementation at operational sites Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE ***FY 2022 Plans:*** - SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects nearing completion of Aegis Combat System component upgrades and improvements at the AAMDTC.			
Title: Site Activation	13.907	23.875	17.487
Articles:	-	-	-
Description: Provide site design, unexploded ordnance clearing; spectrum analysis studies; security; temporary facilities; utilities; administrative communications equipment and services; infrastructure modifications; generator and commercial power; leased vehicles; material handling equipment; generator fuel; supplies, barriers; guard shacks; temporary lighting; transportation of materials and equipment; translators; and emerging requirements as site activation progresses and until sites are transferred to the Navy. Recurring Accomplishments include: - Provide temporary site activation facilities, base operations support, utilities, administrative communications, on-site material handling equipment services, and equipment installation - Fuel for facility commissioning activities, backup generators, and on-site vehicle support - Technical support to facilitate processing facility change proposals and construction modifications - Post-award technical services (structural, mechanical, and electrical) to ensure quality standards and construction schedule is met			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604880C / *Land Based SM-3 (LBSM3)*	**Project (Number/Name)** MD68 / *AEGIS Ashore*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Provide HEMP validation and verification testing of the Aegis Ashore facilities ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects continued program maturation of Site Activation activities as Poland construction nears completion and the Integrated Electrical Security System (IESS) becomes fully operational			
Accomplishments/Planned Programs Subtotals	32.922	51.764	39.594

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208866C MD09: *Aegis BMD O&M*	74.642	79.913	68.293	-	68.293	-	-	-	-	-	-
• 0208866C MD09: *Aegis BMD Procurement*	336.374	353.896	334.621	-	334.621	-	-	-	-	-	-
• 0208866C MD73: *Aegis Ashore Phase III Procurement*	26.495	34.629	25.866	-	25.866	-	-	-	-	-	-
• 0208866C MD90: *Aegis BMD Hardware and Software*	124.150	104.241	81.791	-	81.791	-	-	-	-	-	-
• 0603892C: *AEGIS BMD*	722.582	877.336	732.512	-	732.512	-	-	-	-	-	-
• 0604878C: *Aegis BMD Test*	167.364	71.498	117.055	-	117.055	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The Aegis Ashore Engineering Agent (AAEA) is responsible for the design, development, integration and test of the Aegis Weapons System capability into a reconstitutable deckhouse. The AAEA will also support Aegis Ashore deployment to Romania.

The Mission Support program office is utilizing Naval Facilities Engineering Command (NAVFAC) and U. S. Corps of Engineers Europe District (Core of Engineers North Atlantic Union) CENAU to award and administer contracts for base operating support, commercial power, temporary site activation facilities, and integrated electronic security systems for Romania and Poland sites.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604880C / *Land Based SM-3 (LBSM3)*	Project (Number/Name) MD68 / *AEGIS Ashore*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Aegis Weapon System Development - AWS Development-NAVFAC	MIPR	NAVFAC : HI	5.219	2.600	Nov 2019	3.408	Nov 2020	2.978	Nov 2021	-		2.978	Continuing	Continuing	Continuing
Aegis Weapon System Development - AWS Development-NAVSEA-MD68	MIPR	NAVSEA-LM/BAE, SPAWAR, NSWC CD : San Diego, CA; Baltimore, MD; Minneapolis, MN	11.870	3.150	Nov 2019	5.990	Mar 2021	0.210	Nov 2021	-		0.210	Continuing	Continuing	Continuing
Aegis Weapon System Development - AWS Development-NSWC DD-MD68	MIPR	NSWC Dahlgren : Dahlgren, VA	48.735	1.214	Nov 2019	1.591	Oct 2020	1.100	Nov 2021	-		1.100	Continuing	Continuing	Continuing
Aegis Weapon System Development - AWS Development-NSWC PHD-MD68	MIPR	NSWC PHD, NSWC, DOI, Aegis Techrep : CA, NJ, ID, MD, IN	43.031	2.125	Nov 2019	2.785	Nov 2020	1.200	Nov 2021	-		1.200	Continuing	Continuing	Continuing
Aegis Weapon System Development - AWS Development-PMRF - MD68	MIPR	PMRF : Hawaii	16.804	1.238	Nov 2019	1.609	Nov 2020	1.800	Nov 2021	-		1.800	Continuing	Continuing	Continuing
Aegis Weapon System Development - AWS Development-SPAWAR-MD68	MIPR	NIWC PAC : San Diego,CA	49.024	2.000	Nov 2019	2.621	Nov 2020	1.695	Nov 2021	-		1.695	Continuing	Continuing	Continuing
Aegis Weapon System Development - AWS Development-SSC PAC Pearl Harbor	MIPR	SSC PAC Pearl Harbor : HI	2.246	2.090	Nov 2019	2.739	Nov 2020	0.000		-		0.000	Continuing	Continuing	Continuing
Aegis Weapon System Development - Aegis Weapon System Development - AWS Development-NSWC Crane	MIPR	NSWC Crane : IN	0.000	0.000		0.000		0.300	Nov 2021	-		0.300	Continuing	Continuing	Continuing
Aegis Weapon System Development - Aegis	SS/CPFF	MDA Kupono : HI	0.000	0.000		0.000		1.734	Nov 2021	-		1.734	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604880C / *Land Based SM-3 (LBSM3)*	**Project (Number/Name)** MD68 / *AEGIS Ashore*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Weapon System Development - Aegis Weapon System Development - MD68-MDA															
Aegis Weapon System Development - Aegis Weapon System Development - MD68-	SS/CPFF	MDA Lockheed Martin : Moorestown, NJ	33.244	4.598	Nov 2019	7.146	Nov 2020	8.302	Nov 2021	-		8.302	Continuing	Continuing	Continuing
Aegis Weapon System Development - Aegis Weapon System Development — AWS Development- NSWC-Philadelphia	MIPR	NSWC Philadelphia : PA	0.000	0.000		0.000		0.382	Nov 2021	-		0.382	Continuing	Continuing	Continuing
Aegis Weapon System Development - Aegis Weapon System Development – Restoration & Modernization- MD68	Various	Various : Various	0.000	0.000		0.000		1.296	Nov 2021	-		1.296	Continuing	Continuing	Continuing
Aegis Weapon System Development - Aegis Weapon System Development- AWS Development- Various MD68	Various	Various : CECOM/ MITRE, JHU/APL, MIT/LL, DOI	837.719	0.000		0.000		1.110	Nov 2021	-		1.110	Continuing	Continuing	Continuing
Aegis Weapon System Development - Aegis Weapon System Development- MD68	MIPR	MDA : Arlington	1.076	0.000		0.000		0.000		-		0.000	0.000	1.076	0.000
Site Activation - DTRA support to construction in Romania and Poland	MIPR	DTRA : Ft. Belvoir, VA	4.300	0.426	Nov 2019	0.551	Nov 2020	0.566	Nov 2021	-		0.566	Continuing	Continuing	Continuing
Site Activation - Poland Admin Communication	MIPR	Northrop Grumman : Poland	2.205	0.423	Nov 2019	0.467	Nov 2020	0.640	Nov 2021	-		0.640	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604880C / *Land Based SM-3 (LBSM3)*	Project (Number/Name) MD68 / *AEGIS Ashore*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Site Activation - Poland Base Operating Support	MIPR	NAVFAC : Poland	6.962	7.763	Nov 2019	8.464	Nov 2020	7.025	Nov 2021	-		7.025	Continuing	Continuing	Continuing
Site Activation - Poland Commerical and Temporary Utilities	MIPR	NAVFAC : Poland	0.545	2.223	Nov 2019	2.378	Nov 2020	2.643	Nov 2021	-		2.643	Continuing	Continuing	Continuing
Site Activation - Poland Fuel	MIPR	DLA : Fort Belvoir, Virginia	0.089	0.247	Nov 2019	0.263	Nov 2020	0.243	Oct 2021	-		0.243	Continuing	Continuing	Continuing
Site Activation - Romainia/ Poland Security Guards / Escorts	C/FFP	Chenega Infinity : Chantilly, VA	0.829	0.252	Nov 2019	9.081	Nov 2020	1.873	Nov 2021	-		1.873	Continuing	Continuing	Continuing
Site Activation - Site Activation – Transportation of Aegis Weapon System	MIPR	SDDC : Scotts AFB, IL	5.893	0.012	Nov 2019	0.013	Nov 2020	0.513	Nov 2021	-		0.513	Continuing	Continuing	Continuing
Site Activation - Site Activation- IESS Support	MIPR	USAF LCMC Wright Patterson AFB : OH	0.145	0.000		0.000		0.000		-		0.000	0.000	0.145	0.000
Site Activation - Site Activation- Poland Admin Communications	MIPR	DISA : Scott AFB, IL	0.169	0.125	Nov 2019	0.000		0.000		-		0.000	0.000	0.294	0.000
Site Activation - Site Activation- Site Activation Poland Navy Leases/ Material Handling Services	MIPR	NAVFAC : Naples Italy	1.324	0.000		0.000		0.000		-		0.000	0.000	1.324	0.000
Site Activation - Site Activation-Various	Various	Various : Various	64.185	0.035	Jul 2020	0.000		2.241	Dec 2021	-		2.241	Continuing	Continuing	Continuing
Site Activation - USACE in-house support in Poland	MIPR	CEHNC : Huntsville, AL	1.839	1.899	Nov 2019	1.568	Nov 2020	0.501	Nov 2021	-		0.501	Continuing	Continuing	Continuing
Site Activation - USACE support in Poland	MIPR	CENAU : Poland	3.555	0.502	Nov 2019	1.090	Nov 2020	1.242	Nov 2021	-		1.242	Continuing	Continuing	Continuing
		Subtotal	1,141.008	32.922		51.764		39.594		-		39.594	Continuing	Continuing	N/A

Remarks

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604880C / *Land Based SM-3 (LBSM3)*	Project (Number/Name) MD68 / *AEGIS Ashore*	

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,141.008	32.922		51.764		39.594		-		39.594	Continuing	Continuing	N/A

Remarks

Funding in the All Prior Years column represents a summary of Prior Years Total Costs for inactive contracts and MIPRs on the R-3.
Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604880C / *Land Based SM-3 (LBSM3)*	**Project (Number/Name)** MD68 / *AEGIS Ashore*

Significant Event Complete ▲ Significant Event Planned △ Milestone Decision Complete ★ Milestone Decision Planned ☆ Element Test Complete ◆ Element Test Planned ◇ System Level Test Complete ● System Level Test Planned ○ Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
AAMDTC Upgrades	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Integrated Master Test Plan (IMTP)	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																
Facility Support for NAVEUR Exercise							✧																					
Poland Beneficial Occupancy Date (BOD)										✧	✧																	
Poland Construction Complete											✧																	
EPAA Phase III Technical Capability Declaration (TCD)											✧																	

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604880C / *Land Based SM-3 (LBSM3)*	**Project (Number/Name)** MD68 / *AEGIS Ashore*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
AAMDTC Upgrades	1	2020	4	2022
Integrated Master Test Plan (IMTP)	1	2020	4	2022
Facility Support for NAVEUR Exercise	3	2021	3	2021
Poland Beneficial Occupancy Date (BOD)	2	2022	3	2022
Poland Construction Complete	3	2022	3	2022
EPAA Phase III Technical Capability Declaration (TCD)	3	2022	3	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604880C / *Land Based SM-3 (LBSM3)*	Project (Number/Name) MC68 / *Cyber Operations*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MC68: *Cyber Operations*	5.625	2.365	2.615	0.944	-	0.944	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease from FY 2021 to FY 2022 reflects leveraged learning curve efficiencies and current Program requirements as a result of maturation

A. Mission Description and Budget Item Justification

Sustain Missile Defense Agency (MDA) DoD Information Assurance Certification and Accreditation Program (DIACAP) and Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments and reviews of proposed Program Manager/Information Assurance Manager (PM/IAM) Plans of Action and Milestones (POA&Ms) for MDA Aegis Ballistic Missile Defense (BMD) mission systems. It maintains the Certification and Accreditation (C&A) data repository, capturing the DIACAP documentation (artifacts, validation results, and Information Assurance Risk Assessment results, and Designated Approving Authority (DAA) accreditation decisions) on all MDA Information Systems.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Network / System Certification and Accreditation (C&A)	2.365	2.615	0.944
Articles:	-	-	-
Description: Monitor and track cybersecurity mitigation detailed in Information Technology Security Guidance. Activities include preparation of C&A documentation and accreditation recommendations to the MDA Senior Information Assurance Officer (SIAO)/ Certification Authority (CA) and DAA. Independent Verification and Validation (IV&V) team actions ensure the availability, integrity, authentication, confidentiality and non-repudiation of the MDA mission, test and administrative systems. Activities in the Project are necessary to comply with the Federal Information Security Management Act (FISMA). Recurring Accomplishments: - Provide Cybersecurity engineering and architecture requirements planning for Aegis BMD systems - Coordinate the development and implementation of Aegis BMD Risk Management Framework (RMF) accreditation packages - Conduct regular Controls Validation Testing (CVT) of Aegis BMD systems and provide a Risk Assessment Report (RAR) to mitigate cybersecurity deficiencies - Conduct annual cybersecurity reviews on the Aegis BMD systems to assess compliance in implementing and maintaining RMF controls - Implement HW/SW to conduct continuous daily monitoring - Conduct monthly reviews of systems in eMass - Provide daily management of eMass Specific and/or unique accomplishments to each FY are as follows:			
FY 2021 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604880C / *Land Based SM-3 (LBSM3)*	**Project (Number/Name)** MC68 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects leveraged learning curve efficiencies and current Program requirements as a result of maturation			
Accomplishments/Planned Programs Subtotals	2.365	2.615	0.944

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Program Management Office utilizes the U.S. Navy Centers of Excellence to administer contracts for cyber operations, assessments, and mitigations.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604880C / *Land Based SM-3 (LBSM3)*	Project (Number/Name) MC68 / *Cyber Operations*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Network / System Certification and Accreditation (C&A) - Cyber Operations	MIPR	PMRF : HI	0.000	0.252	Nov 2019	0.332	Nov 2020	0.147	Nov 2021	-		0.147	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - Lockheed Martin	C/CPFF	Lockheed Martin : Moorestown, NJ	0.048	0.000		0.000		0.000		-		0.000	0.000	0.048	0.000
Network / System Certification and Accreditation (C&A) - NAVSEA	MIPR	NAVSEA : Washington, DC	1.843	0.000		0.000		0.000		-		0.000	0.000	1.843	0.000
Network / System Certification and Accreditation (C&A) - NSWC Corona	MIPR	NSWC Corona : CA	0.250	0.000		0.000		0.000		-		0.000	0.000	0.250	0.000
Network / System Certification and Accreditation (C&A) - NSWC Philadelphia	MIPR	Pennsylvania, PA : NSWC Philadelphia	1.407	0.133	Nov 2019	0.173	Nov 2020	0.123	Nov 2021	-		0.123	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - SPAWAR	MIPR	SPAWAR : CA	2.077	1.980	Nov 2019	2.110	Nov 2020	0.674	Nov 2021	-		0.674	Continuing	Continuing	Continuing
		Subtotal	5.625	2.365		2.615		0.944		-		0.944	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	5.625	2.365		2.615		0.944		-		0.944	Continuing	Continuing	N/A

Remarks

Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604880C / *Land Based SM-3 (LBSM3)*	**Project (Number/Name)** MC68 / *Cyber Operations*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
Cyber Operations	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604880C / *Land Based SM-3 (LBSM3)*	**Project (Number/Name)** MC68 / *Cyber Operations*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Cyber Operations	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604880C / *Land Based SM-3 (LBSM3)*	Project (Number/Name) MD40 / *Program-Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program-Wide Support*	41.418	1.631	2.249	2.620	-	2.620	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	1.631	2.249	2.620
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the STEM program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; the FSRM program (formerly Real Property Maintenance) to keep the Department's			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604880C / *Land Based SM-3 (LBSM3)*	**Project (Number/Name)** MD40 / *Program-Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 provides the PWS allocation on a pro-rata basis across multiple Agency PE's each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.			
Accomplishments/Planned Programs Subtotals	1.631	2.249	2.620

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604880C / *Land Based SM-3 (LBSM3)*	Project (Number/Name) MD40 / *Program-Wide Support*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Operations Management	Various	Various: Multi : AL, CA, CO, VA	2.195	0.024	Jul 2020	0.067	Jul 2021	0.055	Apr 2022	-		0.055	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AL, CA, CO, VA	23.295	1.607	Jul 2020	2.182	Jul 2021	2.565	Nov 2021	-		2.565	Continuing	Continuing	Continuing
Program Wide Support - Prior year no longer funded in the FYDP	Various	Various : Various	15.928	0.000		0.000		0.000		-		0.000	0.000	15.928	0.000
		Subtotal	41.418	1.631		2.249		2.620		-		2.620	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	41.418	1.631		2.249		2.620		-		2.620	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604880C / *Land Based SM-3 (LBSM3)*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604880C / *Land Based SM-3 (LBSM3)*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

THIS PAGE INTENTIONALLY LEFT BLANK

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 0604887C *I Ballistic Missile Defense Midcourse Defense Segment Test*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	352.087	96.711	67.071	61.424	-	61.424	-	-	-	-	-	-
MT08: *Midcourse Test*	339.374	93.803	64.407	59.503	-	59.503	-	-	-	-	-	-
MD40: *Program Wide Support*	12.713	2.908	2.664	1.921	-	1.921	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

The decrease from FY 2021 to FY 2022 is in accordance with the current Integrated Master Test Plan (IMTP).

A. Mission Description and Budget Item Justification

Ballistic Missile Defense Midcourse Defense Segment Test provides flight and ground testing of Ground Based Midcourse Defense (GMD) functionality to demonstrate Enhanced Homeland Defense capabilities against long-range threats. The GMD components are tested in an integrated environment with Missile Defense System (MDS) sensors; Command and Control, Battle Management, and Communications (C2BMC); Warfighters; and national collection assets to assess the ability to defend the United States and its territories against ballistic missile attack.

Primary programs include Resources, Flight Test Execution, Ground Test Execution and Program Operations. Provides day-to-day operations of the flight and ground test programs to include engineering support for ground test planning, execution, and post-event reconstruction. Flight tests provide opportunities to test actual hardware and to demonstrate MDS Element interoperability under operationally realistic conditions. Ground tests are executed both in the Hardware-in-the-loop (HWIL) lab and in the field, and provide performance assessments for fielding decisions. Program Operations provides for government management and support of the GMD Test program.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	98.139	67.071	63.240	-	63.240
Current President's Budget	96.711	67.071	61.424	-	61.424
Total Adjustments	-1.428	0.000	-1.816	-	-1.816
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency					Date: May 2021
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 0604887C *I Ballistic Missile Defense Midcourse Defense Segment Test*			
• Other Adjustment	-1.428	0.000	-1.816	-	-1.816

Change Summary Explanation

Decrease in FY 2022 is in accordance with the current Integrated Master Test Plan (IMTP).

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604887C / *Ballistic Missile Defense Midcourse Defense Segment Test*	Project (Number/Name) MT08 / *Midcourse Test*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MT08: *Midcourse Test*	339.374	93.803	64.407	59.503	-	59.503	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The decrease from FY 2021 to FY 2022 is in accordance with the current IMTP.

A. Mission Description and Budget Item Justification

Ballistic Missile Defense Midcourse Defense Segment Test provides flight and ground testing of GMD functionality to demonstrate capabilities against long-range threats. The GMD components are tested in an integrated environment with MDS sensors; C2BMC; Warfighters; and national collection assets to assess the ability to defend the United States and its territories against ballistic missile attack.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Resources	18.815	23.869	19.583
Articles:	-	-	-
Description: Provides day-to-day operations of the flight and ground test programs to include engineering support for ground test planning, execution, and post-event reconstruction. Recurring work: -Provide laboratory environments to support hardware and software testing prior to entry into MDS level tests -Provide the infrastructure and support for execution of tests requested by the warfighter to enhance doctrine and TTPs and tests of opportunity presented by real world events and MDS/external test activities -Provides test infrastructure and coordination of flight test range support from Vandenberg Air Force Base (VAFB), California, for all range activities, engineering, operators and Ground Based Interceptor (GBI) transportation -Provides command and control and situational awareness for the GMD flight and ground test events at the MDA Integration and Operations Center (MDIOC) in Colorado Springs, Colorado and the Readiness and Control Facility (R&C) in Ft. Greely, Alaska -Provides test communication plans, test communication control, satellite communication bandwidth, test network certification and accreditation for GMD flight and ground tests to integrate the range in VAFB, California, MDIOC in Colorado Springs, Colorado, Ft. Greely, Alaska and Pacific Missile Range Facility (PMRF) in Hawaii -Provides engineering, operations and maintenance of the integrated system test labs in Huntsville, Alabama, to conduct MDS flight test pre-mission risk reduction and system level ground testing for fielding warfighter capabilities that defend the homeland -Provides operations and maintenance and equipment upgrades of the Prime Consolidated Integration Lab (PCIL) in Huntsville, Alabama to support flight test pre-mission risk reduction and post-flight reconstruction			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604887C / *Ballistic Missile Defense Midcourse Defense Segment Test*	**Project (Number/Name)** MT08 / *Midcourse Test*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
-Use of the PCIL for testing provides confidence in models and simulations used for evaluation of performance of GMD homeland defense capabilities -Provides equipment upgrades at VAFB and the MDIOC for test support systems Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -Provide the infrastructure and support for execution of GM Boost Vehicle Test (BVT-03, Ground Test (GT)-08 MDS ground tests, and three cybersecurity tests for data collection to support performance evaluation of GMD Increment 6 homeland defense capabilities -Provide laboratory environments to support hardware and software testing prior to entry into MDS level tests -Provide the infrastructure and support for execution of tests requested by the warfighter to enhance doctrine and Tactics, Techniques, & Procedures (TTPs) and tests of opportunity presented by real world events and MDS/external test activities ***FY 2022 Plans:*** -Provide the infrastructure and support for post flight reconstruction and post flight analysis for the GM BVT-03, GT-08 MDS ground tests, and cybersecurity tests for data collection to support performance evaluation of GMD Increment 6 homeland defense capabilities ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The decrease from FY 2021 to FY 2022 is in accordance with the current IMTP.			
Title: Flight Test Execution	34.670	8.773	7.249
Articles:	-	-	-
Description: Flight tests demonstrate the capabilities and/or phenomenology that cannot be adequately tested or obtained during ground testing. Flight tests also provide opportunities to test actual hardware and to demonstrate MDS Element interoperability under operationally realistic conditions. This accomplishment area provides the industry and government personnel for planning, integration, execution, and analysis for MDS homeland defense flight tests. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -Conduct pre-mission analysis, execution rehearsals, and flight test execution for GM BVT-03. This flight test mission demonstrates the 2- or 3-Stage selectable boost vehicle software capability that provides additional engagement battlespace to			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604887C / *Ballistic Missile Defense Midcourse Defense Segment Test*	**Project (Number/Name)** MT08 / *Midcourse Test*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
the warfighter. This test will utilize a previously fielded GBI with a Capability Enhancement (CE)-I Exoatmospheric Kill Vehicle (EKV) and a Configuration (C)1 booster launched from VAFB, California ***FY 2022 Plans:*** -Conduct post flight reconstruction and post-mission analysis for GM BVT-03. This flight test mission demonstrates the 2- or 3-Stage selectable boost vehicle software capability that provides additional engagement battlespace to the warfighter. This test will utilize a previously fielded C1 Booster with a Mass Modal Unit (MMU) launched from VAFB, California -Conduct initial planning for Flight Test GMD (FTG)-12. This flight test mission demonstrate MDS Increment 6B.2 and Increment 6C/7 Homeland Defense functionality upgrades in a GMD intercept flight test using a GBI with a 2-/3-Stage Selectable C2 Booster and a CE-II Block 1 EKV in an engagement of an Intermediate Range Ballistic Missile (IRBM) with CMs launched from VAFB, California. -Support planning, integration and execution for Flight Test Other (FTX)-26 using the GMD Fire Control (GFC). This is a non-intercept operational flight test demonstrating Long Range Discrimination Radar (LRDR) capabilities in MDS Phased Implementation Plan Increment 6B.1. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The decrease from FY 2021 to FY 2022 is in accordance with the current IMTP.			
Title: Ground Test Execution	29.852	20.914	24.113
Articles:	-	-	-
Description: Ground tests demonstrate and validate Warfighter TTPs and provide performance assessments for fielding decisions. Ground tests are executed both in the Hardware-in-the-loop (HWIL) lab and in the field. HWIL lab tests integrate and assess MDS system- level performance based on new element capabilities. Ground tests in the field use existing fielded element assets and tactical communication networks, to integrate, assess and demonstrate the element capabilities. Cybersecurity tests provide cyber resiliency capabilities and vulnerabilities assessments. This accomplishment area provides the industry and government personnel for planning, integration, execution, and analysis for MDS homeland defense ground and cybersecurity tests. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** -Conduct pre-mission analysis, integration, ground test execution, and post-mission analysis for Ground Test Integrated (GTI)-08a and Ground Test Distributed (GTD)-08a (USNORTHCOM/USINDOPACOM) (N/I) for Operational Assessment (OA) of performance for Inc 6B.1 OCB decisions. This event provides data to support fielding for the MDS Inc 6B.1 capability which			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604887C / *Ballistic Missile Defense Midcourse Defense Segment Test*	**Project (Number/Name)** MT08 / *Midcourse Test*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
includes Long Range Discrimination Radar (LRDR), GMD GS8, GMD 2/3 stage capability, and advanced Sea-based, X-band Radar (SBX) discrimination -Conduct pre-mission analysis, integration and execution and post-mission analysis for three Cybersecurity Test events to support MDS weapon system fielding and operational acceptance -Initiate planning of GTI-08b (N/I) for OA of performance for Inc 6B.2 Operational Capability. This event provides data to support fielding for the MDS Inc 6B.2 capability which includes EKV 11 with improved discrimination capability and Space-based Kill Assessment (SKA) -Support and participate in the MDA transition to the new IMTP future ground test Concept of Operations (CONOPs) approach. This approach supports more agile fielding as components of the MDS are ready to integrate and test than conducting a single major test event when all MDS components are ready ***FY 2022 Plans:*** -Conduct pre-mission analysis, integration and execution and post-mission analysis for Cybersecurity Test events to support MDS weapon system fielding and operational acceptance -Conduct pre-mission analysis, integration and execution and post-mission analysis of GTI-08b (N/I) for OA of performance for Inc 6B.2 Operational Capability. This event provides data to support fielding for the MDS Inc 6B.2 capability which includes EKV 11 with improved discrimination capability and Space-based Kill Assessment (SKA) -Conduct pre-mission analysis of GTD-08b (N/I) for OA of performance for Inc 6B.2 Operational Capability. This event provides data to support fielding for the MDS Inc 6B.2 capability which includes EKV 11 with improved discrimination capability and Space-based Kill Assessment (SKA) -Support and participate in the MDA transition to the new IMTP future ground test Concept of Operations (CONOPs) approach. This approach supports more agile fielding as components of the MDS are ready to integrate and test than conducting a single major test event when all MDS components are ready ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The increase from FY 2021 to FY 2022 is in accordance with the current IMTP.			
Title: Program Operations ***Articles:*** ***Description:*** Program Operations provides for government management of the GMD Test program. This effort includes program and business management support activities, financial management, cost and schedule performance analyses, cost estimation and analyses, configuration management, and integration. It also includes activities to provide critical program status and decision quality data and GMD test program compliance with internal and external direction, policies, and regulations to deliver critical capability within a consistent and disciplined process and technical and testing oversight, quality/safety/mission assurance, integrated logistics support, and government manpower and infrastructure to test the GMD system and components.	10.466 -	10.851 -	8.558 -

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604887C / *Ballistic Missile Defense Midcourse Defense Segment Test*	**Project (Number/Name)** MT08 / *Midcourse Test*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
FY 2021 Plans: - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The decrease from FY 2021 to FY 2022 is due to the re-alignment of staffing to support the Next Generation Interceptor (NGI) in the Improved Homeland Defense Interceptors (IHLD) PE: 0604874C in accordance with the IMTP.			
Accomplishments/Planned Programs Subtotals	93.803	64.407	59.503

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0208866C: MD08: *GMD Procurement*	285.471	150.000	0.000	-	0.000	-	-	-	-	-	-
• 0208866C: MD08: *Midcourse Defense O&M*	152.235	148.749	156.623	-	156.623	-	-	-	-	-	-
• 0603882C: *Ballistic Missile Defense Midcourse Defense Segment*	1,275.414	1,219.261	745.144	-	745.144	-	-	-	-	-	-
• 0604874C: *Improved Homeland Defense Interceptors*	514.062	860.384	926.125	-	926.125	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The Ground-based Midcourse Defense (GMD) program will continue to follow testing, development, and evolutionary acquisition through incremental development. The Agency acquisition strategy ensures GMD components are upgraded to improve both All-Up System (AUS) performance and All Up Round (AUR) performance in order to retain the proven GMD contribution to the integrated MDS. This acquisition approach reduces obsolescence risk, provides opportunities for incremental capability improvements, and allows decision makers to make informed trades between cost, schedule, and performance while exploring improved operational and technological capabilities.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604887C / *Ballistic Missile Defense Midcourse Defense Segment Test*	**Project (Number/Name)** MT08 / *Midcourse Test*

GMD awarded a competitive Development and Sustainment Contract (DSC) on December 30, 2011. This contract included development, fielding, test, systems engineering, integration, and configuration management; equipment manufacturing and upgrade; training, operations and sustainment of the GMD system and associated support facilities.

On January 31, 2018, the DSC Extension was awarded to the Boeing Company with a period of performance through 1QFY2024. The DSC Extension includes supporting test, engineering, software, and performance based logistics scope. The DSC structure breaks out major efforts into separate Contract Line Item Numbers with individual incentives for management insight, accounting and property accountability.

The current prime contractor is responsible for the entirety of the GMD scope. GMD's current DSC period of performance ends in December 2023 for general scope with one contract line item remaining to allow the Prime Contractor to complete the delivery of MDS Increment 6c/7 in 2024. Boeing executes the DSC with four major subcontractors: Northrop Grumman Mission Systems (NGMS), Northrop Grumman Innovation Solutions (NGIS), Raytheon Missile Systems (RMS), and Vigor, and many other minor subcontractors.

The GMD Future Acquisition Strategy scope will satisfy future GMD Weapon System requirements beyond DSC's support through MDS Increment 7, and will initiate and execute concurrently while the DSC scope is completing. This scope includes weapon system engineering and integration; ground system hardware and software development; ground and flight tests; and readiness (operations, sustainment, training, and exercises).

The Agency issued four requests for information (RFI) to industry between September 2019 and August 2020. Market Research indicated a competitive environment exists for a portion of future GMD work. MDA hosted GMD Industry Day as well as GMD one-on-one sessions with interested contractors in January 2021. Acquisition documentation and Requests for Proposal are under development to support first Contract Award(s) for GMD Future Acquisition Strategy by 2QFY2022.

MDA reviewed all acquisition equities and determined that based on the existing competitive environment that portions of the future development, production, operations, and sustainment of the GMD should be competitively aligned to minimize program risks and to provide effective defense of the homeland.

GMD Future Acquisition Strategies include:
-MDA plans to competitively award a single System Engineering, Integration, Test, and Readiness (SITR) contract to provide along with the Technical Direction Agent (TDA) a synergistic approach in executing the element-level engineering, integration, test, and readiness of the GMD System.
-MDA plans to competitively award a single GMD Weapon System (GWS) contract to provide design, development, production, product level testing, sustainment planning, and deployment of new capabilities for the Weapon System.
-MDA plans to award sole source contracts to the interceptor's original equipment manufacturers (OEMs) to perform service life extensions, maintain the existing fleet, and support MDS testing and performance assessments.

GMD is also implementing a more robust Program Board structure allowing more Government insight and decisions into the technical baseline and has changed business processes for greater Government involvement in Program decisions. In addition, GMD utilizes Government laboratory Models and Simulation (M&S) and analysis capabilities to augment the current DSC efforts. These efforts utilize existing MDA and Other Government Agency competitively awarded contracts with the

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604887C / *Ballistic Missile Defense Midcourse Defense Segment Test*	**Project (Number/Name)** MT08 / *Midcourse Test*

COLSA Corporation, Vandenberg Air Force Base, CA, MDIOC, U.S. Army Combat Capabilities Development Command Aviation & Missile Center (CCDC formerly known as AMRDEC), and he PMRF in Hawaii.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604887C / *Ballistic Missile Defense Midcourse Defense Segment Test*	**Project (Number/Name)** MT08 / *Midcourse Test*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Operations - Civilian Travel (MDA)	MIPR	MDA : AL	0.000	0.000		0.261	Oct 2020	0.125	Oct 2021	-		0.125	Continuing	Continuing	Continuing
Program Operations - Contract Support Services	C/CPFF	Various AL/AK/ : CA/CO/VA	16.774	5.941	Oct 2019	5.798	Oct 2020	0.000		-		0.000	0.000	28.513	0.000
Program Operations - Government Civilian Salaries	MIPR	MDA AL/ : VA	14.633	4.525	Oct 2019	4.792	Oct 2020	3.877	Oct 2021	-		3.877	Continuing	Continuing	Continuing
		Subtotal	31.407	10.466		10.851		4.002		-		4.002	Continuing	Continuing	N/A

Remarks

$4,556 for Program Operations, Contract Support Services moved from Product Support to Management Services to correct the cost category.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Resources - Cyber Security - Advanced Research Center Cyber Support	C/IDIQ	COLSA Corp : AL	4.162	0.000		0.000		0.000		-		0.000	0.000	4.162	0.000
Resources - Cyber Security - NSITE/GT Communications	MIPR	Army CCDC Aviation & Missile Center : AL	0.138	0.000		0.000		0.000		-		0.000	0.000	0.138	0.000
Resources - Cyber Win10 Implementation - MDDC Lab Analysis Infrastructure	C/IDIQ	Analytical Services, In. : Al	1.449	0.000		0.000		0.000		-		0.000	0.000	1.449	0.000
Resources - Engineering & Analysis - Industry Support	C/CPAF	Boeing : AL	4.221	0.000		0.000		0.000		-		0.000	0.000	4.221	0.000
Resources - Engineering & Analysis - OGA Support	MIPR	Army CCDC Aviation & Missile Center : AL	4.098	0.000		0.000		0.000		-		0.000	0.000	4.098	0.000
Resources - Government Infrastructure	MIPR	VAFB : CA/AL/CO/AK/HI	34.351	8.376	Nov 2019	8.733	Nov 2020	6.440	Nov 2021	-		6.440	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604887C / *Ballistic Missile Defense Midcourse Defense Segment Test*	**Project (Number/Name)** MT08 / *Midcourse Test*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Support, Labs, and Communications															
Resources - Prime Infrastructure Support, Labs, and Communications	C/CPAF	Boeing : AL/AK/AZ/ CA/CO/OR/TX//VA	42.155	10.439	Nov 2019	15.136	Nov 2020	13.143	Nov 2021	-		13.143	Continuing	Continuing	Continuing
Flight Test Execution - Range, Resources, and Engineering	MIPR	VAFB/PMRF, LLL, MIT, Sandia, Northrop Grumman, L3, Analytical Serv, NAWC, NRL, NSWC, CCDC, USASMDC, Dept of Transp Maritime Admin : AL, AK, CA, CO, HI, NM, MD	70.985	3.046	Nov 2019	8.773	Nov 2020	0.000		-		0.000	0.000	82.804	0.000
Flight Test Execution - Test Planning, Test Execution, and Silo Refurbishment	C/CPAF	Boeing/TBD AUR Awardee/GWSRD Awardee : AL/AK/AZ/ CA/CO/OR/TX/VA/ TBD	108.161	31.624	Nov 2019	0.000		7.249	Nov 2021	-		7.249	Continuing	Continuing	Continuing
Ground Test Execution - Cybersecurity Testing	C/CPFF	Boeing : AL, AK, AZ, CA, CO, OR, TX, VA	4.300	21.126	Nov 2019	2.577	Nov 2020	10.440	Nov 2021	-		10.440	Continuing	Continuing	Continuing
Ground Test Execution - Ground Test Sprints	C/CPFF	Boeing : AL, AK, AZ, CA, CO, OR, TX, VA	1.000	0.000		4.448	Nov 2020	13.673	Nov 2021	-		13.673	Continuing	Continuing	Continuing
Ground Test Execution - Ground Test-04 Campaign	C/CPAF	Boeing : AL/AK/AZ/ CA/CO/TX/VA	3.355	0.000		0.000		0.000		-		0.000	0.000	3.355	0.000
Ground Test Execution - Ground Test-06 Campaign	C/CPAF	Boeing : AL/AK/AZ/ CA/CO/TX/VA	8.163	0.000		0.000		0.000		-		0.000	0.000	8.163	0.000
Ground Test Execution - Ground Test-07 Campaign	C/CPAF	Boeing : AL/AK/AZ/ CA/CO/TX/VA	21.338	4.310	Nov 2019	0.000		0.000		-		0.000	0.000	25.648	0.000
Ground Test Execution - Ground Test-08 Campaign	C/CPAF	Boeing : AL/AK/AZ/ CA/CO/TX/VA	0.091	4.416	Nov 2019	13.889	Nov 2020	0.000		-		0.000	0.000	18.396	0.000
		Subtotal	307.967	83.337		53.556		50.945		-		50.945	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604887C / *Ballistic Missile Defense Midcourse Defense Segment Test*	Project (Number/Name) MT08 / *Midcourse Test*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Operations - Contract Support Services	C/CPAF	TEAMS: MacAulay-Brown, Inc, Millennium Eng. & Integ. Co : AL	0.000	0.000		0.000		4.556	Oct 2021	-		4.556	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		4.556		-		4.556	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	339.374	93.803		64.407		59.503		-		59.503	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.
$4,556 for Program Operations, Contract Support Services moved from Product Support to Management Services to correct the cost category.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604887C / *Ballistic Missile Defense Midcourse Defense Segment Test*	**Project (Number/Name)** MT08 / *Midcourse Test*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
GTI-07c (N/I) (MDS Ground Test)	✦																											
GTI-08a (N/I) (MDS Ground Test)				✧	✧	✧	✧	✧																				
GM BVT-03 (GM, DT Interceptor Only Flight Test)								△																				
CVPA-08a (N/I) (BMDS Cybersecurity Test)									○																			
Element Cyber Event: GM CVI-11									✧	✧	✧	✧																
GTD-08a (N/I) (MDS Ground Test)										✧																		
AA-08a (N/I) (BMDS Cybersecurity Test)										○																		
GTI-08b Sprint 1 (N/I) (MDS Ground Test)											✧																	
CVPA-08b (N/I) (MDS Cybersecurity Test)											○																	
Element Cyber Event: GM CTTX-13											◇																	
FTX-26 (OT) (SN, OT Target Only Flight Test)												△																
GTI-08b Sprint 2 (N/I) (MDS Ground Test)												✧																
AA-08b (N/I) (MDS Cybersecurity Test)												○																
SICO-08b (MDS Ground Test)												✧																
Element Cyber Event: GM CVI-13												✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604887C / *Ballistic Missile Defense Midcourse Defense Segment Test*	**Project (Number/Name)** MT08 / *Midcourse Test*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
GTI-07c (N/I) (MDS Ground Test)	1	2020	1	2020
GTI-08a (N/I) (MDS Ground Test)	4	2020	4	2021
GM BVT-03 (GM, DT Interceptor Only Flight Test)	4	2021	4	2021
CVPA-08a (N/I) (BMDS Cybersecurity Test)	1	2022	1	2022
Element Cyber Event: GM CVI-11	1	2022	4	2022
GTD-08a (N/I) (MDS Ground Test)	2	2022	2	2022
AA-08a (N/I) (BMDS Cybersecurity Test)	2	2022	2	2022
GTI-08b Sprint 1 (N/I) (MDS Ground Test)	3	2022	3	2022
CVPA-08b (N/I) (MDS Cybersecurity Test)	3	2022	3	2022
Element Cyber Event: GM CTTX-13	3	2022	3	2022
FTX-26 (OT) (SN, OT Target Only Flight Test)	4	2022	4	2022
GTI-08b Sprint 2 (N/I) (MDS Ground Test)	4	2022	4	2022
AA-08b (N/I) (MDS Cybersecurity Test)	4	2022	4	2022
SICO-08b (MDS Ground Test)	4	2022	4	2022
Element Cyber Event: GM CVI-13	4	2022	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604887C / *Ballistic Missile Defense Midcourse Defense Segment Test*	Project (Number/Name) MD40 / *Program Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program Wide Support*	12.713	2.908	2.664	1.921	-	1.921	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	2.908	2.664	1.921
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the STEM program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; the FSRM program (formerly Real Property Maintenance) to keep the Department's			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604887C / *Ballistic Missile Defense Midcourse Defense Segment Test*	**Project (Number/Name)** MD40 / *Program Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the PWS allocation on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.			
Accomplishments/Planned Programs Subtotals	2.908	2.664	1.921

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604887C / *Ballistic Missile Defense Midcourse Defense Segment Test*	Project (Number/Name) MD40 / *Program Wide Support*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Operations User Services	Reqn	Various : Multi: AL, CA, CO, VA	2.857	1.924	Jun 2020	1.796	Oct 2020	1.078	Nov 2021	-		1.078	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Other Agency Services (MIPRs)	MIPR	Various : Multi: AL, VA	0.032	0.000		0.082	Oct 2020	0.065	Nov 2021	-		0.065	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AL, VA	5.795	0.250	Dec 2019	0.050	Oct 2020	0.050	Nov 2021	-		0.050	Continuing	Continuing	Continuing
Program Wide Support - Agency OperationsManagement	Various	Various : Multi: AL, VA, Aust, Japan	0.342	0.044	Jul 2020	0.030	Jul 2021	0.028	Apr 2022	-		0.028	Continuing	Continuing	Continuing
Program Wide Support - FFRDC/UARC	MIPR	MITRE Corporation : Multi: AL, VA	0.640	0.690	Nov 2019	0.706	Dec 2020	0.700	Dec 2021	-		0.700	Continuing	Continuing	Continuing
Program Wide Support - Prior year no longer funded in the FYDP	Various	Various : Various	3.047	0.000		0.000		0.000		-		0.000	3.047	6.094	0.000
		Subtotal	12.713	2.908		2.664		1.921		-		1.921	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	12.713	2.908		2.664		1.921		-		1.921	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604887C / *Ballistic Missile Defense Midcourse Defense Segment Test*	**Project (Number/Name)** MD40 / *Program Wide Support*

Significant Event Complete ▲ | Significant Event Planned △ | Milestone Decision Complete ★ | Milestone Decision Planned ☆ | Element Test Complete ◆ | Element Test Planned ◇ | System Level Test Complete ● | System Level Test Planned ○ | Complete Activity ✦ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604887C / *Ballistic Missile Defense Midcourse Defense Segment Test*	**Project (Number/Name)** MD40 / *Program Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

THIS PAGE INTENTIONALLY LEFT BLANK

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 0202057C / *Safety Program Management*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	0.000	2.323	-	2.323	-	-	-	-	-	-
MDSH: *Safety Program Management*	-	0.000	0.000	2.323	-	2.323	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

This PE is not a new start. The Occupational Safety and Health program element was established in FY 2022; funding was realigned from Program Elements: 0603882C, BMD Midcourse Defense, 0603884C, BMD Sensors, 0603890C, BMD Enabling Programs, and 0603892C BMD Aegis.

A. Mission Description and Budget Item Justification

MDA Occupational Safety and Health (OSH) establishes the program plans, policy, responsibilities, and guidelines for compliance with statutory, regulatory, and Department of Defense (DoD) policy/program directives. It also establishes MDA OSH programs designed for the protection of human resources through accident prevention; protection of MDA systems, property, and equipment; and the compliance with appropriate statutes, regulations, Executive Orders, and DoD policies. OSH develops and ensures implementation of safety requirements, mitigates safety risks to the lowest practical level, and ensures a safe workplace for all MDA employees and contractors by implementing a Safety and Occupational Health program.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	2.323	-	2.323
Total Adjustments	0.000	0.000	2.323	-	2.323
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	0.000	0.000	2.323	-	2.323

Change Summary Explanation

The Occupational Safety and Health program element was established in FY 2022.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0202057C / *Safety Program Management*	Project (Number/Name) MDSH / *Safety Program Management*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MDSH: *Safety Program Management*	-	0.000	0.000	2.323	-	2.323	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The Occupational Safety and Health program element was established in FY 2022; funding was realigned from Program Elements: 0603882C, BMD Midcourse Defense, 0603884C, BMD Sensors, 0603890C, BMD Enabling Programs, and 0603892C BMD Aegis.

A. Mission Description and Budget Item Justification

MDA Occupational Safety and Health (OSH) establishes the program plans, policy, responsibilities, and guidelines for compliance with statutory, regulatory, and Department of Defense (DoD) policy/program directives. It also establishes MDA OSH programs designed for the protection of human resources through accident prevention; protection of MDA systems, property, and equipment; and the compliance with appropriate statutes, regulations, Executive Orders, and DoD policies. OSH develops and ensures implementation of safety requirements, mitigates safety risks to the lowest practical level, and ensures a safe workplace for all MDA employees and contractors by implementing a Safety and Occupational Health program.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Safety Program Management	0.000	0.000	2.323
Articles:	-	-	-
Description: The Occupational Safety and Health program ensures that all employees are provided a safe and healthful workplace through an aggressive initiative of workplace inspections, audits, and accident investigation processes. The unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** N/A ***FY 2022 Plans:*** SEE ABOVE ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The Occupational Safety and Health program element was established in FY 2022.			
Accomplishments/Planned Programs Subtotals	0.000	0.000	2.323

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0202057C / *Safety Program Management*	**Project (Number/Name)** MDSH / *Safety Program Management*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0202057C / *Safety Program Managem ent*	Project (Number/Name) MDSH / *Safety Program Management*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Safety Program Management - Safety & Occupational Health	C/CPFF	Apt, Inc. : HI, and VA	0.000	0.000		0.000		1.119	Nov 2021	-		1.119	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		1.119		-		1.119	Continuing	Continuing	N/A

Remarks

N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Safety Program Management - Safety Management (MDA Civ)	Allot	MDA : AL, AK, CA	0.000	0.000		0.000		1.079	Oct 2021	-		1.079	Continuing	Continuing	Continuing
Safety Program Management - Safety Operations travel	Allot	MDA : AL, AK, CA	0.000	0.000		0.000		0.125	Nov 2021	-		0.125	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		1.204		-		1.204	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		2.323		-		2.323	Continuing	Continuing	N/A

Remarks

Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0202057C / *Safety Program Management*	**Project (Number/Name)** MDSH / *Safety Program Management*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
Safety & Occupational Health									✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0202057C / *Safety Program Management*	**Project (Number/Name)** MDSH / *Safety Program Management*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Safety & Occupational Health	1	2022	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 0305103C *I Cyber Security Initiative*

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	5.667	11.109	1.148	1.142	-	1.142	-	-	-	-	-	-
MDCS: *Cyber Security Initiative*	5.667	11.109	1.148	1.142	-	1.142	-	-	-	-	-	-

Program MDAP/MAIS Code: 362

Note

N/A

A. Mission Description and Budget Item Justification

The Missile Defense Agency (MDA) Counterintelligence (CI) Division conducts CI in Cyberspace activities pursuant to Department of Defense (DoD) Directive DoDD 5240.02 (Counterintelligence) and DoD Instruction S-5240.23 (CI Activities in Cyberspace) to identify, disrupt, neutralize and mitigate foreign intelligence services and international terrorist organizations, hereafter referred to as foreign entities, to act in observable or exploitable ways. To this end, the MDA CI Division conducts activities to detect, neutralize and mitigate foreign entity-directed malicious and insider threat activities targeting MDA administrative and Missile Defense fire control networks and mobile devices.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	11.138	1.148	1.172	-	1.172
Current President's Budget	11.109	1.148	1.142	-	1.142
Total Adjustments	-0.029	0.000	-0.030	-	-0.030
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.029	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	0.000	0.000	-0.030	-	-0.030

Change Summary Explanation

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0305103C / *Cyber Security Initiative*	Project (Number/Name) MDCS / *Cyber Security Initiative*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MDCS: *Cyber Security Initiative*	5.667	11.109	1.148	1.142	-	1.142	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

The DoD Counterintelligence in Cyberspace (CIC) mission initiative is externally funded and falls under the functional and fiscal management of the Director, Defense Intelligence Agency (DIA). The MDA Counterintelligence (CI) Division conducts defensive CIC activities pursuant to DoD Directive DoDD 5240.02 (Counterintelligence), DoD Instruction S-5240.23 (CI Activities in Cyberspace) and DoD Instruction 5240.26 (Countering Espionage, International Terrorism, and the CI Insider Threat), and an MDA Annex within an annual DIA-approved Implementation Plan.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: DoD CI in Cyberspace Initiative	11.109	1.148	1.142
Articles:	-	-	-
Description: This activity detects, identifies, neutralizes and mitigates malicious activities directed by foreign entities that target MDA cyber assets. The following actions are required on a continuing basis to accomplish the DoD CI in Cyberspace Initiative: -- Collaborate with the MDA Computer Emergency Response Team (CERT) to detect, neutralize and mitigate potential foreign entity directed malicious and insider threat activities targeting MDA administrative and fire control networks, and mobility devices -- Conduct CI Preliminary Inquiries into potential foreign entity directed malicious or insider threat activities and refers suspected incidents or events to the Federal Bureau of Investigation (FBI) or military department CI organizations for further investigation -- Conduct CI forensics analysis of MDA computer network activity logs to identify potential indicators of foreign entity directed malicious, insider threat or computer network attack/exploitation activities targeting MDA information -- Coordinate with national and DoD level intelligence, CI and law enforcement agencies to identify foreign entity cyber actor intrusion sets and the tactics, techniques and procedures used to target MDA and its Cleared Defense Contractor computer networks -- Coordinate with MDA cleared defense contractors that have been compromised by foreign intelligence entities to capture and triage exfiltrated MDA related data, allowing MDA engineering teams to perform proper damage assessments -- Provide required initial and periodic training to ensure the MDA workforce is kept apprised of foreign entity threats to DoD personnel, facilities, information, activities, and information technology systems -- Protect MDA Sensitive Compartmented Information Facility (SCIF) and Special Access Program (SAP) areas from cellular/ wireless device monitoring -- Provide support to the MDA Insider Threat program			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0305103C / *Cyber Security Initiative*	**Project (Number/Name)** MDCS / *Cyber Security Initiative*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	11.109	1.148	1.142

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603890C: *BMD Enabling Programs*	630.196	616.455	595.301	-	595.301	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

This project leverages expertise in the intelligence community, counterintelligence community, and information assurance community, including the Military Services, Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Centers (UARCs), and industry.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0305103C / *Cyber Security Initiative*	**Project (Number/Name)** MDCS / *Cyber Security Initiative*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DoD CI in Cyberspace Initiative - CI in Cyberspace	Allot	MDA : VA	0.923	0.146	Oct 2019	0.161	Oct 2020	0.156	Oct 2021	-		0.156	Continuing	Continuing	Continuing
DoD CI in Cyberspace Initiative - Counterintelligence	C/CPFF	TEAMS : VA, AL	4.003	0.854	Nov 2019	0.819	Nov 2020	0.838	Nov 2021	-		0.838	Continuing	Continuing	Continuing
DoD CI in Cyberspace Initiative - Cybersecurity Upgrades at Cheyenne Mountain	C/CPIF	Lockheed Martin : CO	0.000	10.000	Feb 2020	0.000		0.000		-		0.000	0.000	10.000	0.000
DoD CI in Cyberspace Initiative - Technical Surveillance & Countermeasures	MIPR	USA-TAO : Ft. Detrick, MD	0.741	0.109	Nov 2019	0.168	Nov 2020	0.148	Nov 2021	-		0.148	Continuing	Continuing	Continuing
		Subtotal	5.667	11.109		1.148		1.142		-		1.142	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	5.667	11.109		1.148		1.142		-		1.142	Continuing	Continuing	N/A

Remarks

Award Dates reflect date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0305103C / *Cyber Security Initiative*	**Project (Number/Name)** MDCS / *Cyber Security Initiative*

Significant Event Complete ▲ | Significant Event Planned △ | Milestone Decision Complete ★ | Milestone Decision Planned ☆ | Element Test Complete ◆ | Element Test Planned ◇ | System Level Test Complete ● | System Level Test Planned ○ | Complete Activity ✦ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MDCS Cyber Security Initiative	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0305103C / *Cyber Security Initiative*	**Project (Number/Name)** MDCS / *Cyber Security Initiative*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MDCS Cyber Security Initiative	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency											Date: May 2021	
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 1206893C / *Space Tracking and Surveillance System*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	71.122	35.469	34.144	15.176	-	15.176	-	-	-	-	-	-
MD12: *Space Tracking and Surveillance System (STSS)*	63.499	31.796	32.044	14.437	-	14.437	-	-	-	-	-	-
MC12: *Cyber Operations*	4.349	2.147	0.744	0.156	-	0.156	-	-	-	-	-	-
MD40: *Program-Wide Support*	3.274	1.526	1.356	0.583	-	0.583	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

Decrease from FY 2021 to FY 2022 reflects the decision to passivate the Space Tracking and Surveillance System (STSS) satellites by 3rd quarter FY 2022 due to end of service life assessment.

A. Mission Description and Budget Item Justification

The two Space Tracking and Surveillance System (STSS) satellites launched in 2009 provide an on-orbit capability to validate remote sensor fire control integration to inform design and operation of the Missile Defense Agency (MDA) space-layer capabilities. MDA uses STSS data to characterize contribution of space data into the Missile Defense System (MDS) and to provide sensor measurements and background data supporting trade studies and analyses for MDA space-layer options for both Homeland and Regional Defense.

STSS continues to provide risk reduction for MDA space capabilities, models, algorithms, interface definitions, communications architectures, and performance across threat object acquisition, tracking, complex target signatures, discrimination, and multi-mission support. STSS also informs the MDS Concept of Operations, timelines, and performance requirements for remote space sensor cuing for ballistic missile engagements, expanding battle space for weapon systems such as Aegis Ballistic Missile Defense (BMD).

The STSS program demonstrates the functions and interfaces required for space data delivery to the MDS, validating the data quality necessary for interceptors to launch and/or engage on STSS sensor data. The two STSS satellites are operated from the ground station processing center at the Missile Defense Space Center (MDSC). The STSS satellites demonstrate MDA space-layer capabilities and reduce risk for future systems (e.g., Hypersonic and Ballistic Tracking Space Sensor) by viewing high-value Targets of Opportunity and participating in MDS flight tests. Though the STSS satellites are operating beyond their life expectancy, MDA continues STSS operations due to the continued contributions to the MDS mission. Based on annual health and status assessment of the STSS satellites, a decision to passivate the STSS satellites in FY 2022 was made. This decision enables a safe conclusion and continued stewardship of space for the extremely successful STSS program which demonstrated the necessity of on-orbit detection and tracking capability for the MDS.

The MDSC provides MDA's only centralized collaboration and integration environment that leverages existing Overhead Persistent Infrared (OPIR) enterprise integration in support of MDS research and development test, and sensor operations. The MDSC capabilities and infrastructure support flight tests, operational concept and

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 1206893C *I Space Tracking and Surveillance System*

prototype development, technology demonstrations, experiments, and algorithm development within a multi-security, collaborative environment to integrate and exploit national space asset data. The MDSC also conducts studies and experiments with MDA assets such as the Spacebased Kill Assessment (SKA), and STSS, as well as other agencies' assets.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	36.349	34.144	34.657	-	34.657
Current President's Budget	35.469	34.144	15.176	-	15.176
Total Adjustments	-0.880	0.000	-19.481	-	-19.481
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.880	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	0.000	0.000	-19.481	-	-19.481

Change Summary Explanation

Decrease in FY 2022 reflects decision to passivate the STSS satellites in FY 2022, bringing the program to a conclusion. Funding realigned to PE 1206895C, Budget Project MD42, to support continued development of the Hypersonic and Ballistic Tracking Space Sensor (HBTSS) program.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / *Space Tracking and Surveil lance System*	Project (Number/Name) MD12 / *Space Tracking and Surveillance System (STSS)*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD12: *Space Tracking and Surveillance System (STSS)*	63.499	31.796	32.044	14.437	-	14.437	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The decrease from FY 2021 to FY 2022 reflects the decision to passivate the STSS satellites by 3rd quarter FY 2022 due to end of service life assessment. Residual funding is transferred to PE 1206895C, Budget Project MD42, to support continued development of the Hypersonic and Ballistic Tracking Space Sensor (HBTSS) program.

A. Mission Description and Budget Item Justification

Two Space Tracking and Surveillance System (STSS) satellites provide a low earth orbit sensor capability with visible and infrared sensors for integrated testing with other Missile Defense System (MDS) elements. STSS demonstrates space-based capabilities including persistent tracking and integrated MDS discrimination improvements. These two satellites provide valuable risk reduction for acquisition, tracking, complex scenes, and discrimination functionality to include stereo data fusion, cuing radars over-the-horizon, and over-the-horizon fire control.

The on-orbit sensors collect invaluable background, scene, and target signature data to support the Missile Defense Agency (MDA) space-layer and other weapon sensor development trade studies. STSS activities provide information for integration of space-based missile tracking (midcourse phase); remote sensor and weapons cuing via Command and Control, Battle Management and Communications (C2BMC); features and discrimination; and hit/impact point assessments. STSS enables early capability assessment to address Warfighter need for highly available early missile tracking from space, providing an operationally suitable means of global persistent surveillance and engagement. Capabilities being assessed for MDA space-layer capabilities include detecting and acquiring missiles; tracking missiles and their deployed objects; performing autonomous acquisition-to-track handover within a satellite; performing tracking handover to a satellite from a ground cue; performing uplink and downlink of mission, health, and status data both directly and via crosslink between two satellites; reporting missile and intercept event to close the fire-control loop; filtering reports to C2BMC; and providing near real-time object data to external users. STSS support to other mission areas improves definition for Enterprise system approaches.

The Missile Defense Space Center (MDSC) provides capabilities and infrastructure to support space operations, integration, and testing with the MDS. It provides a multi-level security environment for sensor data management and integration across space and terrestrial sensor data activities. MDSC experiments leverage DoD and national security space capabilities. MDSC activities support analyses, demonstration, and integration of space sensor capabilities into developmental and operational MDA elements. MDSC enables the development of advanced technology and algorithms including fusion of multiple sensor types (radar, overhead persistent infrared, electro-optical, and other emerging sensor technologies). It also supports mission integration of space-based missile tracking, sensor and weapons cuing via C2BMC, features and discrimination, kill, and impact point assessments into the MDS and other non-MDA mission areas, including Space Situational Awareness and battle space characterization.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206893C / *Space Tracking and Surveillance System*	**Project (Number/Name)** MD12 / *Space Tracking and Surveillance System (STSS)*

Lessons learned and data gathered from the STSS demonstration satellites program provide valuable information for MDA space-layer modeling and simulation activities in assessing the capability provided by Overhead Persistent Infrared sensors.

Based on annual health and status assessment of the STSS satellites, a decision to passivate the STSS satellites in FY 2022 was made. This decision enables a safe conclusion and continued stewardship of space for the extremely successful STSS program which demonstrated the necessity of on-orbit detection and tracking capability for the MDS.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Demonstration Satellites	31.796	32.044	14.437
Articles:	-	-	-
Description: The Space Tracking and Surveillance System (STSS) demonstration satellites collect and deliver critical space and missile characterization data used to design and inform the Missile Defense System (MDS) and space-layer capabilities. The Missile Defense Space Center (MDSC) facilities and activities are required for safe STSS satellite operations and sustainment. STSS activities include: - Perform risk reduction for MDA tracking and surveillance initiatives and Overhead Persistent Infrared (OPIR) Enterprise integration and demonstrations across OPIR cuing, Joint Tasking Operations, and data utility - Collect data to support joint OPIR mission utility assessments across Space Situational Awareness and Battle Space Awareness missions to include integration, analyses, and studies to confirm data sharing capabilities - Participate in Integrated Master Test Plan events - Conduct satellite testing to demonstrate critical space capabilities, including: -- Ability to support MDS integrated discrimination efforts -- Ability to support Hit/Kill assessment from space -- Ability to cue MDS sensors from space -- Ability to provide precision cue to MDS sensors - Perform satellite functionality testing and calibration as part of the satellite operations - Conduct missile tracking experiments as identified in the test specific sections - Provide Space Operations Command Space Situational Awareness support MDSC efforts related to STSS include: - Analyze space radiation environment and its influence on MDA space system performance - Analyze space-based sensor data from STSS and OPIR observations, both individually and combined, to identify phenomenology and techniques to aid tracking and discrimination architectures - Provide data for concept studies and analyses for alternative sensor payload configurations - Sustain MDSC resources for all participant activities, including data, voice, and/or video communications, and support MDA cybersecurity directives			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206893C / *Space Tracking and Surveil lance System*	**Project (Number/Name)** MD12 / *Space Tracking and Surveillance System (STSS)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Document requirements and perform tracking, design, implementation, and verification necessary for the MDSC facility - Implement ongoing and emerging cybersecurity requirements Specific and/or unique accomplishments to each Fiscal Year (FY) are as follows: ***FY 2021 Plans:*** - SEE ABOVE ***FY 2022 Plans:*** - Perform activities required for safe passivation of the two STSS satellites - Conduct contract close-out activities ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects decision to passivate the STSS satellites in FY 2022, bringing the program to a conclusion.			
Accomplishments/Planned Programs Subtotals	31.796	32.044	14.437

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603882C: *Ballistic Missile Defense Midcourse Defense Segment*	1,275.414	1,219.261	745.144	-	745.144	-	-	-	-	-	-
• 0603884C: *Ballistic Missile Defense Sensors*	348.356	265.803	224.750	-	224.750	-	-	-	-	-	-
• 0603890C: *BMD Enabling Programs*	630.196	616.455	595.301	-	595.301	-	-	-	-	-	-
• 0603892C: *AEGIS BMD*	722.582	877.336	732.512	-	732.512	-	-	-	-	-	-
• 0603896C: *Ballistic Missile Defense Command and Control, Battle Management & Communication*	550.513	645.741	603.448	-	603.448	-	-	-	-	-	-
• 0603904C: *Missile Defense Integration and Operations Center (MDIOC)*	54.783	55.356	52.403	-	52.403	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206893C / *Space Tracking and Surveil lance System*	**Project (Number/Name)** MD12 / *Space Tracking and Surveillance System (STSS)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603914C: *Ballistic Missile Defense Test*	398.939	365.208	362.906	-	362.906	-	-	-	-	-	-
• 0603915C: *Ballistic Missile Defense Targets*	545.764	536.133	553.334	-	553.334	-	-	-	-	-	-
• 1206895C: *Ballistic Missile Defense System Space Programs*	139.887	162.068	292.811	-	292.811	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The STSS demonstration satellites program follows MDA's capability-based acquisition strategy that emphasizes testing, incremental development, and evolutionary acquisition. The STSS effort utilizes a single prime contractor, Northrop Grumman Aerospace Systems (NGAS) with the subcontractor Raytheon providing the sensor payload. This contract implements MDA's capability-based acquisition strategy by using existing satellite hardware as a low risk opportunity, building upon the lessons learned from previous development efforts, and establishing a series of planned enhancements to bring added capability to the MDS.

MDSC efforts will be acquired on the Specialized Warfighter Development Contract and Integrated Research and Development for Enterprise Solutions vehicles. These contracts are responsible for integrating Research, Development, Test and Evaluation, operations support, and resource and infrastructure management for the MDSC.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206893C / *Space Tracking and Surveillance System*	**Project (Number/Name)** MD12 / *Space Tracking and Surveillance System (STSS)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Demonstration Satellites - Capability Based R&D	SS/CPAF	NGAS : Redondo Beach, CA, Schriever AFB, CO	42.307	19.621	Nov 2019	20.352	Nov 2020	6.750	Nov 2021	-		6.750	0.000	89.030	69.409
Demonstration Satellites - STSS Support to Missile Defense Space Center (MDSC)	C/CPFF	Northrop Grumman/ Jacobs Engineering : Schriever AFB, CO	6.951	2.430	Nov 2019	3.805	Nov 2020	0.000		-		0.000	0.000	13.186	13.554
Demonstration Satellites - Systems Engineering	FFRDC	Aerospace : Los Angeles, CA	0.995	0.573	Nov 2019	0.000		0.000		-		0.000	0.000	1.568	1.568
		Subtotal	50.253	22.624		24.157		6.750		-		6.750	0.000	103.784	N/A

Remarks

All efforts listed above are a continuation of Program Element (PE) 0603893C, MD12

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Demonstration Satellites - Contract Support Services (CSS)	C/Various	Various : AL, CO	5.122	3.108	Nov 2019	3.072	Nov 2020	3.111	Dec 2021	-		3.111	0.000	14.413	14.413
Demonstration Satellites - IT User Services	C/CPAF	Northrop Grumman/ Jacobs Engineering : AL, AK, CA, CO, HI, NM, VA	1.194	0.646	Dec 2019	0.651	Dec 2020	0.636	Dec 2021	-		0.636	0.000	3.127	3.127
Demonstration Satellites - MDA Civilian	Allot	MDA : AL, CO	4.385	3.439	Oct 2019	3.478	Oct 2020	3.567	Oct 2021	-		3.567	0.000	14.869	14.869
Demonstration Satellites - Other Government Agency (OGA) Civilian	MIPR	SMC : Schriever AFB, CO	0.325	0.167	Nov 2019	0.000		0.000		-		0.000	0.000	0.492	0.492
Demonstration Satellites - Program Mission Support	Various	Various : Various	1.384	1.472	Nov 2019	0.346	Nov 2020	0.033	Nov 2021	-		0.033	0.000	3.235	32.353

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / *Space Tracking and Surveil lance System*	Project (Number/Name) MD12 / *Space Tracking and Surveillance System (STSS)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Demonstration Satellites - UARC	C/CPFF	Utah University, Space Dynamics Laboratory : CO, VA	0.836	0.340	Nov 2019	0.340	Nov 2020	0.340	Nov 2021	-		0.340	0.000	1.856	1.856
		Subtotal	13.246	9.172		7.887		7.687		-		7.687	0.000	37.992	N/A

Remarks

All efforts listed above are a continuation of PE 0603893C, MD12

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	63.499	31.796		32.044		14.437		-		14.437	0.000	141.776	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206893C / *Space Tracking and Surveil lance System*	**Project (Number/Name)** MD12 / *Space Tracking and Surveillance System (STSS)*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
STSS Demonstration Satellites-MDS Flight Tests/Targets of Opportunity - 1Q2020	▲																											
STSS Demonstration Satellites On-Orbit Operations - 1Q2020-4Q2020	✦	✦	✦	✦																								
MIS Operations - 1Q2020-4Q2020	✦	✦	✦	✦																								
Mission Planning, Tasking and Analysis - 1Q2020-4Q2020	✦	✦	✦	✦																								
MDSC TIL Operations - 1Q2020-4Q2020	✦	✦	✦	✦																								
STSS Demonstration Satellites-MDS Flight Tests/Targets of Opportunity - 2Q2020		▲																										
STSS Demonstration Satellites-MDS Flight Tests/Targets of Opportunity - 3Q2020			▲																									
STSS Demonstration Satellites-MDS Flight Tests/Targets of Opportunity - 4Q2020				▲																								
MIS Operations - 1Q2021-4Q2021					✧	✧	✧	✧																				
STSS Demonstration Satellites On-Orbit Operations - 1Q2021-4Q2021					✧	✧	✧	✧																				
STSS Demonstration Satellites-MDS Flight Tests/Targets of Opportunity - 1Q2021					▲																							
Mission Planning, Tasking and Analysis - 1Q2021-4Q2021					✧	✧	✧	✧																				
MDSC TIL Operations - 1Q2021-4Q2021					✧	✧	✧	✧																				
STSS Demonstration Satellites-MDS Flight Tests/Targets of Opportunity - 2Q2021						△																						
STSS Demonstration Satellites-MDS Flight Tests/Targets of Opportunity - 3Q2021							△																					
STSS Demonstration Satellites-MDS Flight Tests/Targets of Opportunity - 4Q2021								△																				
Satellite Passivation/Contract Completion									✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206893C / *Space Tracking and Surveillance System*	**Project (Number/Name)** MD12 / *Space Tracking and Surveillance System (STSS)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
STSS Demonstration Satellites-MDS Flight Tests/Targets of Opportunity - 1Q2020	1	2020	1	2020
STSS Demonstration Satellites On-Orbit Operations - 1Q2020-4Q2020	1	2020	4	2020
MIS Operations - 1Q2020-4Q2020	1	2020	4	2020
Mission Planning, Tasking and Analysis - 1Q2020-4Q2020	1	2020	4	2020
MDSC TIL Operations - 1Q2020-4Q2020	1	2020	4	2020
STSS Demonstration Satellites-MDS Flight Tests/Targets of Opportunity - 2Q2020	2	2020	2	2020
STSS Demonstration Satellites-MDS Flight Tests/Targets of Opportunity - 3Q2020	3	2020	3	2020
STSS Demonstration Satellites-MDS Flight Tests/Targets of Opportunity - 4Q2020	4	2020	4	2020
MIS Operations - 1Q2021-4Q2021	1	2021	4	2021
STSS Demonstration Satellites On-Orbit Operations - 1Q2021-4Q2021	1	2021	4	2021
STSS Demonstration Satellites-MDS Flight Tests/Targets of Opportunity - 1Q2021	1	2021	1	2021
Mission Planning, Tasking and Analysis - 1Q2021-4Q2021	1	2021	4	2021
MDSC TIL Operations - 1Q2021-4Q2021	1	2021	4	2021
STSS Demonstration Satellites-MDS Flight Tests/Targets of Opportunity - 2Q2021	2	2021	2	2021
STSS Demonstration Satellites-MDS Flight Tests/Targets of Opportunity - 3Q2021	3	2021	3	2021
STSS Demonstration Satellites-MDS Flight Tests/Targets of Opportunity - 4Q2021	4	2021	4	2021
Satellite Passivation/Contract Completion	1	2022	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / *Space Tracking and Surveil lance System*	Project (Number/Name) MC12 / *Cyber Operations*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MC12: *Cyber Operations*	4.349	2.147	0.744	0.156	-	0.156	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Decrease reflects decision to passivate the STSS satellites in FY 2022, bringing the program to a conclusion.

A. Mission Description and Budget Item Justification

Space Tracking and Surveillance System (STSS) Cyber Operations sustain the Missile Defense Agency (MDA) Risk Management Framework (RMF) and Security Controls Assessments (SCA)/Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments and reviews of proposed Program Manager/ Information System Security Manager (PM/ISSM) Plans of Action and Milestones (POA&Ms) for MDA STSS mission systems. Activities in this Project are necessary to comply with the Federal Information Security Management Act (FISMA).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Network / System Certification and Accreditation (C&A)	2.147	0.744	0.156
Articles:	-	-	-
Description: This activity maintains the Assessment and Authorization (A&A) and C&A data repository, capturing the RMF documentation (artifacts, validation results, and Information Assurance Risk Assessment results, and Designated Approving Authority (DAA) accreditation decisions) and POA&Ms on all MDA information systems. This activity prepares and submits C&A documentation and accreditation recommendations to the MDA Chief Information Officer (CIO) /Certification Authority and the DAA. Independent Verification and Validation team actions ensure the availability, integrity, authentication, confidentiality, and non-repudiation of MDA mission, test, and administrative systems. Recurring accomplishments include the following: - Monitor and track cybersecurity and mitigations detailed in Information Technology security POA&Ms - Conduct cybersecurity design, engineering, and architecture planning for STSS information technology systems - Plan and test the cybersecurity controls for STSS and MDSC systems - Conduct SCA testing continuous monitoring of STSS and MDSC mission systems and provide POA&Ms to mitigate cybersecurity vulnerabilities Specific and/or unique accomplishments to each Fiscal Year (FY) are as follows:			
FY 2021 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206893C / *Space Tracking and Surveillance System*	**Project (Number/Name)** MC12 / *Cyber Operations*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
See Above ***FY 2022 Plans:*** - Support STSS passivation activities ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease in FY 2022 from FY 2021 reflects decision to passivate the STSS satellites in FY 2022, bringing the program to a conclusion.			
Accomplishments/Planned Programs Subtotals	2.147	0.744	0.156

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206893C / *Space Tracking and Surveillance System*	**Project (Number/Name)** MC12 / *Cyber Operations*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Network / System Certification and Accreditation (C&A) - Civ Cyber Labor	Allot	MDA : Schriever AFB	0.346	0.187	Oct 2019	0.171	Oct 2020	0.156	Oct 2021	-		0.156	0.000	0.860	0.860
Network / System Certification and Accreditation (C&A) - Contractor Support	C/Various	Various : AL, CO	0.926	0.570	Nov 2019	0.573	Nov 2020	0.000		-		0.000	0.000	2.069	2.069
Network / System Certification and Accreditation (C&A) - Cross Domain Upgrade	C/CPFF	Jacobs : Schriever AFB, CO	0.000	0.019	Apr 2020	0.000		0.000		-		0.000	0.000	0.019	0.019
Network / System Certification and Accreditation (C&A) - Information Assurance	C/CPAF	NGAS : Schriever AFB, CO/Redondo Beach, CA	3.077	1.371	Mar 2020	0.000		0.000		-		0.000	0.000	4.448	4.448
		Subtotal	4.349	2.147		0.744		0.156		-		0.156	0.000	7.396	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	4.349	2.147		0.744		0.156		-		0.156	0.000	7.396	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206893C / *Space Tracking and Surveil lance System*	**Project (Number/Name)** MC12 / *Cyber Operations*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MC12 Cyber Operations	✦	✦	✦	✦																								
MC12 Cyber Operations Planned					✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206893C / *Space Tracking and Surveillance System*	**Project (Number/Name)** MC12 / *Cyber Operations*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MC12 Cyber Operations	1	2020	4	2020
MC12 Cyber Operations Planned	1	2021	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / *Space Tracking and Surveil lance System*	Project (Number/Name) MD40 / *Program-Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program-Wide Support*	3.274	1.526	1.356	0.583	-	0.583	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency PEs each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	1.526	1.356	0.583
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment,			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206893C / *Space Tracking and Surveillance System*	**Project (Number/Name)** MD40 / *Program-Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects the PWS allocation on a pro-rata basis across multiple Agency PE's each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.			
Accomplishments/Planned Programs Subtotals	1.526	1.356	0.583

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / *Space Tracking and Surveillance System*	Project (Number/Name) MD40 / *Program-Wide Support*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Operations and Support Services	C/CPAF	Northrop Grumman : CO	2.592	1.503	Jul 2020	1.315	Nov 2020	0.557	Nov 2021	-		0.557	0.000	5.967	0.000
Program Wide Support - Agency Operations Management	C/CPAF	Various Multi: AL, CA, CO, : VA	0.463	0.023	Jul 2020	0.041	Jul 2021	0.026	Apr 2022	-		0.026	0.000	0.553	0.000
Program Wide Support - Prior year no longer funded in the FYDP	Various	Various : Various	0.219	0.000		0.000		0.000		-		0.000	0.000	0.219	0.000
		Subtotal	3.274	1.526		1.356		0.583		-		0.583	0.000	6.739	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	3.274	1.526		1.356		0.583		-		0.583	0.000	6.739	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206893C / *Space Tracking and Surveil lance System*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206893C / *Space Tracking and Surveillance System*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 1206895C / *Ballistic Missile Defense System Space Programs*

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	68.268	139.887	162.068	292.811	-	292.811	-	-	-	-	-	-
MD24: *Test Support*	-	0.239	0.000	0.000	-	0.000	-	-	-	-	-	-
MD33: *MD Space Exp Center (MDSEC)*	61.310	24.967	30.408	30.066	-	30.066	-	-	-	-	-	-
MD42: *Hypersonic & Ballistic Tracking Space Sensor (HBTSS) Prototyping*	-	108.139	130.000	256.222	-	256.222	-	-	-	-	-	-
MC33: *MD Space Exp Center (MDSEC)*	5.469	5.370	0.386	1.358	-	1.358	-	-	-	-	-	-
MD40: *Program-Wide Support*	1.489	1.172	1.274	5.165	-	5.165	-	-	-	-	-	-

Program MDAP/MAIS Code: 362

Note

In FY 2019, the Hypersonic and Ballistic Tracking Space Sensor (HBTSS), formerly called the Space Sensor Layer (SSL) effort was funded in Budget Project MD37. Beginning in FY 2020, HBTSS was funded in Budget Project MD42. FY 2019, FY 2020, and FY 2021 funding was provided via Congressional plus up.

Increase from FY 2021 to FY 2022 provides for HBTSS spacecraft bus procurement and associated Assembly, Integration and Test (AI&T) activities, initiates supporting on-orbit test and calibration support activities, acquiring launch services through Space Force Space Systems Command (SSC) for testing of HBTSS in an operationally representative orbit, and funding for cyber activities in support of HBTSS.

A. Mission Description and Budget Item Justification

Spacebased Kill Assessment (SKA): The SKA project will deliver hit and kill assessment from space. Missile Defense Agency (MDA) Missile Defense System (MDS) intercept testing experience provided a solid understanding of kill assessment physics to enable exploration of this critical capability. SKA incorporates Government Accountability Office (GAO) recommendations to examine the operational feasibility of disaggregating large satellites (report number GAO-15-7) and to provide data for the business case for shared or dedicated satellite control, including the ground antenna networks (report number GAO-13-315). The favorable cost and schedule performance on SKA is also consistent with the GAO's assessment of commercially hosted payload programs (report number GAO-18-493). The SKA experiment utilizes a network of small Infrared (IR) sensors integrated onto commercial host satellites that while on orbit observe missile defense intercepts and deliver hit and kill assessment declarations to the MDS. After successful participation in MDS Flight Tests in FY 2019, the MDA Director made the decision to begin transition of SKA to an operational element of the MDS.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
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 1206895C *I Ballistic Missile Defense System Space Programs*

HBTSS: HBTSS is a schedule-focused, cost-constrained capability that will detect and track hypersonic threats and boosting conventional ballistic missiles. The key characteristic of HBTSS that sets it apart from other Overhead Persistent Infrared (OPIR) sensors is the requirement to provide fire-control quality tracking data. This information will be handed off to the MDS hypersonic weapons systems to allow long range engagement of the threat and the enhanced tracking accuracy, through missile burn out, will provide the warfighter increased missile defense weapons systems engagement capability and higher accuracy impact predictions. The requirement for fire-control data necessitates that HBTSS be highly sensitive, low-latency, high quality of service system. MDA is collaborating with the U.S. Space Force, under the leadership of the Chief of Space Operations, and the Space Development Agency to deploy HBTSS as an element within the larger OPIR enterprise architecture.

This PE also funds Cybersecurity efforts necessary to support BMDS Space Programs.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	140.565	32.068	28.591	-	28.591
Current President's Budget	139.887	162.068	292.811	-	292.811
Total Adjustments	-0.678	130.000	264.220	-	264.220
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	120.000			
• Congressional Directed Transfers	0.000	10.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.678	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	0.000	0.000	264.220	-	264.220

Change Summary Explanation

Increase in FY 2021 provides Congressional add for Hypersonic and Ballistic Tracking Space Sensor (HBTSS) and a transfer from Space Technology Development and Prototyping for HBTSS.

Increase in FY 2022 provides for HBTSS development, Spacebased Kill Assessment (SKA) integration and operationalization, and for MD Program Wide Support.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206895C / *Ballistic Missile Defense System Space Programs*	Project (Number/Name) MD24 / *Test Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD24: *Test Support*	-	0.239	0.000	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

Provides funding for access, scheduling, and assessment support for heavy ion single event effects testing at a specialized federally funded research center facility; Testing series is non-recurring on a small sample lot.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Spacebased Kill Assessment	0.239	0.000	0.000
Articles:	-	-	-
Description: Support for heavy ion single event effects testing at a specialized federally funded research center facility. ***FY 2021 Plans:*** N/A ***FY 2022 Plans:*** N/A ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	0.239	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206895C / *Ballistic Missile Defense System Space Programs*	Project (Number/Name) MD24 / *Test Support*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Spacebased Kill Assessment - Test Support	MIPR	Lawrence Berkeley : Berkeley, California	0.000	0.239	Sep 2020	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	0.000	0.239		0.000		0.000		-		0.000	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.239		0.000		0.000		-		0.000	Continuing	Continuing	N/A

Remarks

N/A

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206895C / *Ballistic Missile Defense System Space Programs*	**Project (Number/Name)** MD24 / *Test Support*

Significant Event Complete ▲ | Milestone Decision Complete ★ | Element Test Complete ◆ | System Level Test Complete ● | Complete Activity ✦
Significant Event Planned △ | Milestone Decision Planned ☆ | Element Test Planned ◇ | System Level Test Planned ○ | Planned Activity ✧

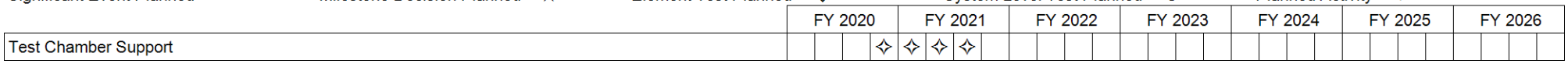


Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206895C / *Ballistic Missile Defense System Space Programs*	**Project (Number/Name)** MD24 / *Test Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Test Chamber Support	4	2020	3	2021

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206895C / *Ballistic Missile Defense System Space Programs*	Project (Number/Name) MD33 / *MD Space Exp Center (MDSEC)*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD33: *MD Space Exp Center (MDSEC)*	61.310	24.967	30.408	30.066	-	30.066	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

The Spacebased Kill Assessment (SKA) system is composed of two segments: a space segment and a ground segment.

The space segment is composed of a network of small infrared (IR) sensors (sensors, processor cards and cabling), each mated to a different satellite. The total number of sensors and their network placement are specifically tailored for the hit and kill assessment missions. The space segment includes key design features to improve its resiliency.

The ground segment monitors the health and status of the on-orbit sensors, commands the sensors to perform the hit and kill assessment mission, and analyzes the data to make a hit/kill assessment determination for the Missile Defense System (MDS). The ground segment also includes the equipment necessary for communications security and information assurance. The Missile Defense Space Center (MDSC) provides the critical infrastructure for SKA data, routing SKA data between the commercial payload integrator and the SKA Payload Analysis Center. The operational command and control center for SKA, the Payload Operations Center (POC), will support MDS Post Intercept Assessment (PIA) capabilities.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Spacebased Kill Assessment	24.967	30.408	30.066
Articles:	-	-	-
Description: The Spacebased Kill Assessment (SKA) project is designed to deliver hit and kill assessment for Homeland Defense. It includes: - SKA sensor-host satellite integration and testing - On-orbit operations by experimenting and participating in MDS ground and flight tests - Integration of SKA into the MDS operational baseline - Integration of SKA messages into Post Intercept Assessment (PIA) module for delivery to the Warfighter - Development of hit and kill assessment algorithms required to add SKA to the operational MDS			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206895C / *Ballistic Missile Defense System Space Programs*	**Project (Number/Name)** MD33 / *MD Space Exp Center (MDSEC)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
- Supporting engineering trade studies and concept evaluations for current and future space-based sensors Specific and/or unique accomplishments to each Fiscal Year (FY) are as follows: ***FY 2021 Plans:*** - Complete development of modeling and simulation capability for ground test participation required to add SKA to the operational MDS - Begin to participate in MDS ground testing to support operational declaration - Transition to POC for SKA operations - Complete operational network upgrades and training program ***FY 2022 Plans:*** - Complete development of the operational hit assessment software code - Continue developing kill assessment and ground test hit assessment algorithms and threat models - Continue to finalize integration of the SKA messages into the MDS operational interface in support of adding SKA capability to the operational all-domain MDS ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	24.967	30.408	30.066

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603882C: *Ballistic Missile Defense Midcourse Defense Segment*	1,275.414	1,219.261	745.144	-	745.144	-	-	-	-	-	-
• 0603884C: *Ballistic Missile Defense Sensors*	348.356	265.803	224.750	-	224.750	-	-	-	-	-	-
• 0603892C: *AEGIS BMD*	722.582	877.336	732.512	-	732.512	-	-	-	-	-	-
• 0603896C: *Ballistic Missile Defense Command and Control, Battle Management & Communication*	550.513	645.741	603.448	-	603.448	-	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206895C / *Ballistic Missile Defense System Space Programs*	**Project (Number/Name)** MD33 / *MD Space Exp Center (MDSEC)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603904C: *Missile Defense Integration and Operations Center (MDIOC)*	54.783	55.356	52.403	-	52.403	-	-	-	-	-	-
• 0603914C: *Ballistic Missile Defense Test*	398.939	365.208	362.906	-	362.906	-	-	-	-	-	-
• 0603915C: *Ballistic Missile Defense Targets*	545.764	536.133	553.334	-	553.334	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

SKA leverages experience that the Johns Hopkins University Applied Physics Laboratory (JHU/APL) has with its extensive history of performing kill assessment activities and conducting experiments associated with the Aegis BMD program. JHU/APL is the developer of the SKA experiment and its primary subcontractor will be responsible for payload integration and hosting accommodation using a firm fixed price contract to contain costs. The SKA experiment uses a commercial satellite program as the platform host for a DOD payload, taking full advantage of a multi-billion dollar space and ground system that already exists.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206895C / *Ballistic Missile Defense System Space Programs*	**Project (Number/Name)** MD33 / *MD Space Exp Center (MDSEC)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Spacebased Kill Assessment - Development and Experimentation	C/CPFF	JHU/APL : Laurel, MD	27.505	10.729	Nov 2019	13.179	Nov 2020	11.145	Nov 2021	-		11.145	Continuing	Continuing	Continuing
Spacebased Kill Assessment - Experimental Ops Team	C/CPFF	JHU/APL : Laurel, MD	1.056	1.082	Nov 2019	1.072	Nov 2020	0.000		-		0.000	0.000	3.210	3.210
Spacebased Kill Assessment - Incremental Capability Operations	C/CPFF	Various : Schriever AFB, CO	0.000	0.000		0.000		8.279	Nov 2021	-		8.279	Continuing	Continuing	Continuing
Spacebased Kill Assessment - Integrate SKA into MDS Comms Network	C/CPFF	Jacobs Engineering : Schriever AFB, CO	0.000	0.259	Aug 2020	0.000		0.000		-		0.000	0.000	0.259	0.259
Spacebased Kill Assessment - MDSC Support	C/CPFF	Northrop Grumman : Schriever AFB, CO	0.551	0.047	Nov 2019	0.000		0.000		-		0.000	0.000	0.598	0.598
Spacebased Kill Assessment - Software Assurance	MIPR	DEVCOM : AL	0.000	0.000		0.769	Apr 2021	0.788	Dec 2021	-		0.788	Continuing	Continuing	Continuing
Spacebased Kill Assessment - Transition To Ops (Mission Systems)	C/Various	Various : MDA CO, AL	0.250	7.356	Nov 2019	5.032	Nov 2020	0.000		-		0.000	0.000	12.638	12.638
Spacebased Kill Assessment - Transition to Ops (Developer)	C/CPFF	JHU/APL : Laurel, MD	1.660	3.257	Nov 2019	7.674	Nov 2020	7.135	Nov 2021	-		7.135	Continuing	Continuing	Continuing
Space Sensor Layer (SSL) - Space Sensor Layer (SSL) - Ground Segment	C/CPAF	Jacobs : Schriever AFB	3.798	0.000		0.000		0.000		-		0.000	0.000	3.798	3.798
Space Sensor Layer (SSL) - Space Sensor Layer (SSL) - Space Prototype Concept Activity	MIPR	SMC SpEC OTA : Various	7.207	0.000		0.000		0.000		-		0.000	0.000	7.207	7.207
		Subtotal	42.027	22.730		27.726		27.347		-		27.347	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206895C / *Ballistic Missile Defense System Space Programs*	**Project (Number/Name)** MD33 / *MD Space Exp Center (MDSEC)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Spacebased Kill Assessment - Contract Support Services (CSS)	C/Various	Various : CO, VA	0.644	0.874	Nov 2019	1.254	Nov 2020	1.500	Nov 2021	-		1.500	Continuing	Continuing	Continuing
Spacebased Kill Assessment - FFRDC/ UARC	Various	Various : CO, AL, MD, VA, CA	1.539	0.902	Nov 2019	0.927	Nov 2020	0.867	Nov 2021	-		0.867	Continuing	Continuing	Continuing
Spacebased Kill Assessment - IT User Services	C/CPAF	Northrop Grumman : AK, CA, CO, HI, NM, VA	0.046	0.054	Nov 2019	0.054	Nov 2020	0.054	Dec 2021	-		0.054	Continuing	Continuing	Continuing
Spacebased Kill Assessment - MDA Civilian	Allot	MDA : VA	0.452	0.219	Oct 2019	0.220	Oct 2020	0.156	Oct 2021	-		0.156	Continuing	Continuing	Continuing
Spacebased Kill Assessment - Program Mission Support	C/Various	Various : CO, AL, MD, VA	0.107	0.188	Oct 2019	0.227	Oct 2020	0.142	Nov 2021	-		0.142	Continuing	Continuing	Continuing
Space Sensor Layer (SSL) - Space Sensor Layer (SSL) - Contract Support Services (CSS)	C/CPFF	Various : CO, AL	4.805	0.000		0.000		0.000		-		0.000	0.000	4.805	4.805
Space Sensor Layer (SSL) - Space Sensor Layer (SSL) - FFRDC	MIPR	Various : CA, CO, NM, VA	6.766	0.000		0.000		0.000		-		0.000	0.000	6.766	6.766
Space Sensor Layer (SSL) - Space Sensor Layer (SSL) - MDA Civilian	Allot	MDA : CO, AL	0.744	0.000		0.000		0.000		-		0.000	0.000	0.744	0.744
Space Sensor Layer (SSL) - Space Sensor Layer	C/Various	Various : CO, AL, VA	0.978	0.000		0.000		0.000		-		0.000	0.000	0.978	0.978

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206895C / *Ballistic Missile Defense System Space Programs*	**Project (Number/Name)** MD33 / *MD Space Exp Center (MDSEC)*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
(SSL) - Program Mission Support															
Space Sensor Layer (SSL) - Space Sensor Layer (SSL) - UARC	C/CPFF	Various : UT, MD	3.202	0.000		0.000		0.000		-		0.000	0.000	3.202	3.202
		Subtotal	19.283	2.237		2.682		2.719		-		2.719	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	61.310	24.967		30.408		30.066		-		30.066	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206895C / *Ballistic Missile Defense System Space Programs*	**Project (Number/Name)** MD33 / *MD Space Exp Center (MDSEC)*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
SKA Experimentation - 1Q2020-4Q2020	✦	✦	✦	✦																								
MDS Integration	✦	✦	✦	✦																								
FTM-44 (AEGIS 5.1, DT Intercept Flight Test)					▲																							
MDS Integration Planned					✧	✧	✧	✧	✧	✧	✧	✧																
SKA/PIA Experimentation - 1Q2021-4Q2021					✧	✧	✧	✧																				
FTT-21 (TH, DT Intercept Flight Test)								△																				
FTX-26 (OT) (SN, OT Target Only Flight Test)												△																
SKA/PIA Experimentation - 1Q2022-4Q2022									✧	✧	✧	✧																
GTI-08b Sprint 1 (N/I) (MDS Ground Test)											✧																	

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206895C / *Ballistic Missile Defense System Space Programs*	**Project (Number/Name)** MD33 / *MD Space Exp Center (MDSEC)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
SKA Experimentation - 1Q2020-4Q2020	1	2020	4	2020
MDS Integration	1	2020	4	2020
FTM-44 (AEGIS 5.1, DT Intercept Flight Test)	1	2021	1	2021
MDS Integration Planned	1	2021	4	2022
SKA/PIA Experimentation - 1Q2021-4Q2021	1	2021	4	2021
FTT-21 (TH, DT Intercept Flight Test)	4	2021	4	2021
FTX-26 (OT) (SN, OT Target Only Flight Test)	4	2022	4	2022
SKA/PIA Experimentation - 1Q2022-4Q2022	1	2022	4	2022
GTI-08b Sprint 1 (N/I) (MDS Ground Test)	3	2022	3	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206895C / *Ballistic Missile Defense System Space Programs*	Project (Number/Name) MD42 / *Hypersonic & Ballistic Tracking Space Sensor (HBTSS) Prototyping*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD42: *Hypersonic & Ballistic Tracking Space Sensor (HBTSS) Prototyping*	-	108.139	130.000	256.222	-	256.222	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2019 Hypersonic and Ballistic Tracking Space Sensor (HBTSS), formerly called the Space Sensor Layer (SSL), was funded in budget project MD37. Beginning in FY 2020, HBTSS is being funded in budget project MD42.

Increase from FY 2021 to FY 2022 provides for Spacecraft Bus procurement and associated Assembly, Integration and Test (AI&T) activities, initiates on-orbit test and calibration support activities, and acquiring launch services through Space Force Space Systems Command (SSC) for testing of HBTSS in an operationally representative orbit.

A. Mission Description and Budget Item Justification

HBTSS will provide a resilient, flexible, and global capability to detect and track hypersonic threats and boosting conventional ballistic missiles. The fire-control quality tracking data will be handed off to the hypersonic weapons systems to allow long range engagement of the threat while enhanced tracking accuracy through missile burn out will provide the warfighting community increased capability in missile defense weapons systems engagement and higher accuracy impact predictions.

The HBTSS priority is to maintain the pace of the development schedule to meet the urgent warfighter need to address rapidly developing threats. To meet this priority, HBTSS must use high technology readiness level components, take advantage of existing government capabilities to minimize development, use a management culture that does not slow down the pace of development, and use Other Transaction Authority (OTA) to minimize contracting cycle times. OTAs allow the Government to work with traditional, non-traditional, and new space businesses to identify innovative solutions.

The HBTSS requirements are derived from United States Strategic Command (USSTRATCOM) Prioritized Capabilities List (PCL), the National Defense Authorization Act for Fiscal Year 2019, and the Joint Requirements Oversight Council (JROC) Capability Development Document (CDD) for Missile Warning (MW)/Missile Defense (MD) Overhead Persistent Infrared (OPIR).

HBTSS developed target signal-to-clutter algorithms and evaluated them in a Signal-chain Processing Demonstration, (SCPD), providing insight into the constellation architecture, communications approach, and preliminary command and control design aspects. These results informed the development of the HBTSS prototype demonstration space vehicles and demonstrated the ability to detect and track dim targets in a cluttered background along with the sensitivity necessary to support the hypersonic kill chain.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206895C / *Ballistic Missile Defense System Space Programs*	**Project (Number/Name)** MD42 / *Hypersonic & Ballistic Tracking Space Sensor (HBTSS) Prototyping*

Like other MDA space sensors, HBTSS is planned to integrate with the existing Joint OPIR Ground (JOG) architecture for mission tasking and data distribution. This OPIR enterprise architecture will be integrated with the terrestrial Missile Defense System (MDS) sensors to improve missile defense architecture capabilities.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Hypersonic and Ballistic Tracking Space Sensor (HBTSS)	108.139	130.000	256.222
Articles:	-	-	-

Description: HBTSS is a space-based missile tracking sensor/system program to address warfighter requirements. The goal of this effort is to develop prototype space sensors to:
-Detect and track hypersonic threats as well as boosting conventional ballistic missiles
-Support MW/MD mission
-Support other missions, as capable
-Leverage inherent multi-domain capabilities to provide as capable support to the OPIR Enterprise

Recurring activities include:
- Constellation analysis and mission management design
- Ground Segment Sustainment
- HBTSS program management, oversight, and mission support

Specific and/or unique accomplishments to each Fiscal Year (FY) are as follows:

FY 2021 Plans:
- Continue development of the missile defense HBTSS Phase IIb acquisition consisting of competitive prototyping of demonstration space vehicle designs leading to two Critical Design Reviews
- Continue tracking algorithm maturation
- Commence flight IR sensor payload assembly and integration
- Continue development and implementation of HBTSS ground system

FY 2022 Plans:
- Acquire launch services through SSC to support planned launch date and unique orbital requirements for the MDS mission
- Complete spacecraft bus procurement, assembly, integration, and testing
- Complete ground system implementation and continue integration and testing in support of Phase IIb
- Complete payload(s) development, assembly, integration and test (AI&T)
- Initiate Space Vehicle assembly, integration, and test activities
- Initiate on-orbit test and calibration support activities

FY 2021 to FY 2022 Increase/Decrease Statement:

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206895C / *Ballistic Missile Defense System Space Programs*	**Project (Number/Name)** MD42 / *Hypersonic & Ballistic Tracking Space Sensor (HBTSS) Prototyping*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Increase from FY 2021 to FY 2022 provides for spacecraft bus procurement and associated AI&T activities, initiates on-orbit test and calibration support activities, and acquiring launch services through SSC for testing of HBTSS in an operationally representative orbit.			
Accomplishments/Planned Programs Subtotals	108.139	130.000	256.222

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 0603890C: *BMD Enabling Programs*	630.196	616.455	595.301	-	595.301	-	-	-	-	-	-
• 0603896C: *Ballistic Missile Defense Command and Control, Battle Management & Communication*	550.513	645.741	603.448	-	603.448	-	-	-	-	-	-
• 0604181C: *Hypersonic Defense*	386.528	272.632	247.931	-	247.931	-	-	-	-	-	-
• 1206893C: *Space Tracking and Surveillance System*	35.469	34.144	15.176	-	15.176	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

The HBTSS acquisition approach delivers a warfighting capability using a phased approach. Each phase has a limited duration, is capability focused, and allows HBTSS to maintain schedule, reduce risk, and add new technology and capabilities when ready.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206895C / *Ballistic Missile Defense System Space Programs*	**Project (Number/Name)** MD42 / *Hypersonic & Ballistic Tracking Space Sensor (HBTSS) Prototyping*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hypersonic and Ballistic Tracking Space Sensor (HBTSS) - Component Testing	MIPR	Lawrence Berkley National Lab : Berkley, CA	0.000	0.139	Aug 2020	0.000		0.000		-		0.000	0.000	0.139	0.139
Hypersonic and Ballistic Tracking Space Sensor (HBTSS) - Ground Segment	C/Various	Jacobs, Various : CO, MD	0.000	21.904	Feb 2020	20.185	Feb 2021	21.754	Nov 2021	-		21.754	Continuing	Continuing	Continuing
Hypersonic and Ballistic Tracking Space Sensor (HBTSS) - Launch Services	MIPR	Space Systems Command : CA	0.000	0.000		0.000		110.000	Dec 2021	-		110.000	110.000	220.000	110.000
Hypersonic and Ballistic Tracking Space Sensor (HBTSS) - Payload Risk Reduction	MIPR	Northrop Grumman : Huntsville, AL	0.000	6.269	Jun 2020	0.000		0.000		-		0.000	0.000	6.269	6.269
Hypersonic and Ballistic Tracking Space Sensor (HBTSS) - Phase IIa Team 1	C/FFP	Harris Corporation : Various	0.000	3.995	Feb 2020	0.000		0.000		-		0.000	0.000	3.995	3.995
Hypersonic and Ballistic Tracking Space Sensor (HBTSS) - Phase IIa Team 2	C/FFP	Leidos : San Diego, CA	0.000	3.995	Feb 2020	0.000		0.000		-		0.000	0.000	3.995	3.995
Hypersonic and Ballistic Tracking Space Sensor (HBTSS) - Phase IIa Team 3	C/FFP	Northrop Grumman : Los Angeles, CA	0.000	4.000	Feb 2020	0.000		0.000		-		0.000	0.000	4.000	4.000
Hypersonic and Ballistic Tracking Space Sensor (HBTSS) - Phase IIa Team 4	C/FFP	Raytheon : Los Angeles, CA	0.000	3.959	Feb 2020	0.000		0.000		-		0.000	0.000	3.959	3.959
Hypersonic and Ballistic Tracking Space Sensor	C/FFP	L3 Harris : Ft. Wayne, IN	0.000	25.000	Sep 2020	43.100	Jan 2021	42.870	Nov 2021	-		42.870	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206895C / *Ballistic Missile Defense System Space Programs*	**Project (Number/Name)** MD42 / *Hypersonic & Ballistic Tracking Space Sensor (HBTSS) Prototyping*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
(HBTSS) - Phase IIb Team 1															
Hypersonic and Ballistic Tracking Space Sensor (HBTSS) - Phase IIb Team 2	C/FFP	Northrop Grumman : Los Angeles, CA	0.000	25.000	Sep 2020	61.490	Jan 2021	58.100	Nov 2021	-		58.100	Continuing	Continuing	Continuing
Hypersonic and Ballistic Tracking Space Sensor (HBTSS) - Test Campaign Support	C/TBD	TBD : TBD	0.000	0.000		0.000		8.000	May 2022	-		8.000	Continuing	Continuing	Continuing
		Subtotal	0.000	94.261		124.775		240.724		-		240.724	Continuing	Continuing	N/A

Remarks

N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hypersonic and Ballistic Tracking Space Sensor (HBTSS) - Contract Support Services (CSS)	C/Various	Various : CO, AL	0.000	4.644	Feb 2020	2.022	Feb 2021	4.955	Nov 2021	-		4.955	Continuing	Continuing	Continuing
Hypersonic and Ballistic Tracking Space Sensor (HBTSS) - FFRDC/UARC	Various	Various : CA, CO, AL, NM	0.000	8.205	Feb 2020	2.108	Jun 2021	8.594	Nov 2021	-		8.594	Continuing	Continuing	Continuing
Hypersonic and Ballistic Tracking Space Sensor (HBTSS) - MDA Civilian	Allot	MDA : CO, AL	0.000	0.231	Feb 2020	0.495	Feb 2021	1.316	Nov 2021	-		1.316	Continuing	Continuing	Continuing
Hypersonic and Ballistic Tracking Space Sensor (HBTSS) - Program Mission Support	C/Various	Various : CA, CO, AL	0.000	0.798	Feb 2020	0.600	Feb 2021	0.633	Nov 2021	-		0.633	Continuing	Continuing	Continuing
		Subtotal	0.000	13.878		5.225		15.498		-		15.498	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206895C / *Ballistic Missile Defense System Space Programs*	**Project (Number/Name)** MD42 / *Hypersonic & Ballistic Tracking Space Sensor (HBTSS) Prototyping*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	108.139		130.000		256.222		-		256.222	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206895C / *Ballistic Missile Defense System Space Programs*	**Project (Number/Name)** MD42 / *Hypersonic & Ballistic Tracking Space Sensor (HBTSS) Prototyping*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
Ground System Development Q2 FY 2020 - Q4 FY 2020		✦	✦	✦																								
Preliminary Concept Review (PCR)				✦	✦																							
Ground System Development Q1 FY 2021 - Q4 FY 2021					✧	✧	✧	✧																				
Long Lead Procurement						✧	✧	✧	✧																			
Spacecraft Bus Procurement						✧	✧	✧	✧	✧																		
Payload Assembly/Integration/Test							✧	✧	✧	✧	✧																	
Critical Design Reviews									△																			
Ground System Development Q1 FY 2022 - Q4 FY 2022									✧	✧	✧	✧																
Payload Calibration Test Review (PCTR)											△																	
Space Vehicle Assembly/Integration/Test												✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206895C / *Ballistic Missile Defense System Space Programs*	**Project (Number/Name)** MD42 / *Hypersonic & Ballistic Tracking Space Sensor (HBTSS) Prototyping*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Ground System Development Q2 FY 2020 - Q4 FY 2020	2	2020	4	2020
Preliminary Concept Review (PCR)	4	2020	1	2021
Ground System Development Q1 FY 2021 - Q4 FY 2021	1	2021	4	2021
Long Lead Procurement	2	2021	1	2022
Spacecraft Bus Procurement	2	2021	2	2022
Payload Assembly/Integration/Test	3	2021	3	2022
Critical Design Reviews	1	2022	1	2022
Ground System Development Q1 FY 2022 - Q4 FY 2022	1	2022	4	2022
Payload Calibration Test Review (PCTR)	3	2022	3	2022
Space Vehicle Assembly/Integration/Test	4	2022	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206895C / *Ballistic Missile Defense System Space Programs*	Project (Number/Name) MC33 / *MD Space Exp Center (MDSEC)*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MC33: *MD Space Exp Center (MDSEC)*	5.469	5.370	0.386	1.358	-	1.358	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

Ballistic Missile Defense System (BMDS) Space Programs Cyber Operations sustain the Missile Defense Agency (MDA) Risk Management Framework (RMF) and Security Controls Assessments (SCA)/Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments, and reviews of proposed Program Manager/Information System Security Manager (PM/ISSM) Plans of Action and Milestones (POA&Ms) for BMDS Space Program mission systems. Activities in this Project are necessary to comply with the Federal Information Security Management Act (FISMA).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Network / System Certification and Accreditation (C&A)	5.370	0.386	1.358
Articles:	-	-	-

Description: This activity maintains the Assessment and Authorization (A&A) and C&A data repository, capturing the RMF documentation (artifacts, validation results, and Information Assurance Risk Assessment results, and Designated Approving Authority (DAA) accreditation decisions) and POA&Ms on all MDA information systems. This activity prepares and submits C&A documentation and accreditation recommendations to the MDA Chief Information Officer (CIO) /Certification Authority and the DAA. Independent Verification and Validation team actions ensure the availability, integrity, authentication, confidentiality, and non-repudiation of the MDA mission, test, and administrative systems. Recurring accomplishments include the following:
- Monitor and track cybersecurity and mitigations detailed in Information Technology security POA&Ms
- Conduct cybersecurity design, engineering, and architecture planning for information technology systems
- Plan and test the cybersecurity controls for space systems
- Conduct SCA testing continuous monitoring of mission systems and provide POA&Ms to mitigate cybersecurity vulnerabilities

Specific and/or unique accomplishments to each Fiscal Year (FY) are as follows:

FY 2021 Plans:
SEE ABOVE

FY 2022 Plans:

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206895C / *Ballistic Missile Defense System Space Programs*	**Project (Number/Name)** MC33 / *MD Space Exp Center (MDSEC)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
SEE ABOVE			
FY 2021 to FY 2022 Increase/Decrease Statement: Increase provides for allocation of funding for cyber activities in support of Hypersonic and Ballistic Tracking Space Sensor			
Accomplishments/Planned Programs Subtotals	5.370	0.386	1.358

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206895C / *Ballistic Missile Defense System Space Programs*	**Project (Number/Name)** MC33 / *MD Space Exp Center (MDSEC)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Network / System Certification and Accreditation (C&A) - CORE Upgrade	C/CPFF	Northrop Grumman : Schriever AFB, CO	1.157	0.000		0.000		0.000		-		0.000	0.000	1.157	1.157
Network / System Certification and Accreditation (C&A) - Contractor Support Services (CSS)	C/Various	Various : AL, CO, MD	1.281	0.817	Nov 2019	0.386	Nov 2020	1.358	Nov 2021	-		1.358	Continuing	Continuing	Continuing
Network / System Certification and Accreditation (C&A) - MDSEA Solutions	C/CPFF	Jacobs : Schriever AFB, CO	1.106	2.365	Apr 2020	0.000		0.000		-		0.000	0.000	3.471	1.106
Network / System Certification and Accreditation (C&A) - Network/Comm Assurance	Various	Various : Various	0.148	1.665	Mar 2020	0.000		0.000		-		0.000	0.000	1.813	1.648
Network / System Certification and Accreditation (C&A) - SKA Communications	C/CPFF	JHU/APL : MD	0.360	0.000		0.000		0.000		-		0.000	0.000	0.360	0.360
Network / System Certification and Accreditation (C&A) - Strengthening Risk Management Framework	C/CPAF	Northrop Grumman, Various : Schriever AFB, CO	1.417	0.523	Mar 2020	0.000		0.000		-		0.000	0.000	1.940	3.917
		Subtotal	5.469	5.370		0.386		1.358		-		1.358	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	5.469	5.370		0.386		1.358		-		1.358	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206895C / *Ballistic Missile Defense System Space Programs*	Project (Number/Name) MC33 / *MD Space Exp Center (MDSEC)*	

	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206895C / *Ballistic Missile Defense System Space Programs*	**Project (Number/Name)** MC33 / *MD Space Exp Center (MDSEC)*

Significant Event Complete ▲ Significant Event Planned △ | Milestone Decision Complete ★ Milestone Decision Planned ☆ | Element Test Complete ◆ Element Test Planned ◇ | System Level Test Complete ● System Level Test Planned ○ | Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MC33 Cyber Operations	✦	✦	✦	✦																								
MC33 Cyber Operations Planned					✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206895C / *Ballistic Missile Defense System Space Programs*	**Project (Number/Name)** MC33 / *MD Space Exp Center (MDSEC)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MC33 Cyber Operations	1	2020	4	2020
MC33 Cyber Operations Planned	1	2021	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206895C / *Ballistic Missile Defense System Space Programs*	Project (Number/Name) MD40 / *Program-Wide Support*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD40: *Program-Wide Support*	1.489	1.172	1.274	5.165	-	5.165	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Wide Support (PWS) is allocated on a pro-rata basis across multiple Agency Program Elements (PE) each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.

A. Mission Description and Budget Item Justification

PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment, Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Program Wide Support	1.172	1.274	5.165
Articles:	-	-	-
Description: PWS contains non-headquarters management costs in support of MDA functions and activities across the entire MDS. These functions include Government Civilians and Contract Support Services. This effort provides integrity and oversight of the MDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes personnel to support global deployments performing deployment site preparation and activation, and provides facility capabilities for MDA Executing Agent locations worldwide. Other MDA wide costs include: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations across multiple geographic locations; commercial and ancillary facility services; management of all facility aspects regardless of lifecycle stage; supplies and maintenance; compliance with statutory environmental requirements; data and unified communications support; materiel and readiness and central property management of equipment; Facilities Sustainment,			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206895C / *Ballistic Missile Defense System Space Programs*	**Project (Number/Name)** MD40 / *Program-Wide Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Restoration and Modernization (FSRM) program, (formerly Real Property Maintenance) to keep the Department's inventory of facilities in good working order; and similar operating expenses. PWS is allocated on a pro-rata basis across most Agency PEs and therefore fluctuates per PE by fiscal year based on the total Agency budget in that fiscal year. ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Increase from FY 2021 to FY 2022 reflects the PWS allocation on a pro-rata basis across multiple Agency PE's each fiscal year based on the total Agency budget, and therefore fluctuates per PE by fiscal year.			
Accomplishments/Planned Programs Subtotals	1.172	1.274	5.165

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206895C / *Ballistic Missile Defense System Space Programs*	**Project (Number/Name)** MD40 / *Program-Wide Support*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2020 Cost	FY 2020 Award Date	FY 2021 Cost	FY 2021 Award Date	FY 2022 Base Cost	FY 2022 Base Award Date	FY 2022 OCO Cost	FY 2022 OCO Award Date	FY 2022 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Wide Support - Agency Facilities and Maintenance	MIPR	Various : Multi: AL, CA, CO, VA	0.000	0.000		0.371	Nov 2020	0.023	Nov 2021	-		0.023	Continuing	Continuing	Continuing
Program Wide Support - Agency Facilities and Maintenance SRM	MIPR	Various : Multi: AK, AL, CA, CO, HI, NY, VA	0.000	0.000		0.000		0.029	Nov 2021	-		0.029	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations Management	C/CPAF	Various Multi: AL, CA, : CO, VA	0.062	0.018	Jul 2020	0.000		0.000		-		0.000	0.000	0.080	0.000
Program Wide Support - Agency Operations and Support Other Agency Services	MIPR	Various : Multi: AK, AL, CO, CA, HI, MD, VA	0.000	0.000		0.000		0.380	Nov 2021	-		0.380	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPFF	Various : Multi: AL, CO, CA, VA	1.427	1.154	Jul 2020	0.903	Dec 2020	4.733	Nov 2021	-		4.733	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations, Sustainment and GPC	C/FFP	Various : Multi: AK, AL, CA, HI, NY, VA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	0.000
		Subtotal	1.489	1.172		1.274		5.165		-		5.165	Continuing	Continuing	N/A

Remarks

N/A

	Prior Years	FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1.489	1.172		1.274		5.165		-		5.165	Continuing	Continuing	N/A

Remarks

Award Date reflects date of first obligation. Additional obligations may incrementally occur throughout the year.

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206895C / *Ballistic Missile Defense System Space Programs*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Significant Event Complete ▲ Significant Event Planned △ Milestone Decision Complete ★ Milestone Decision Planned ☆ Element Test Complete ◆ Element Test Planned ◇ System Level Test Complete ● System Level Test Planned ○ Complete Activity ✦ Planned Activity ✧

	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
MD40 Program-Wide Support	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧																

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 1206895C / *Ballistic Missile Defense System Space Programs*	**Project (Number/Name)** MD40 / *Program-Wide Support*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MD40 Program-Wide Support	1	2020	4	2022

Note

Based on the OUSD(C) FY 2022 President's Budget Submission Guidance, fiscal years covered in the justification material will include FY 2020 through FY 2022. Planned entries in the R4 may continue past FY 2022, out-years will be addressed in future budget submissions.

THIS PAGE INTENTIONALLY LEFT BLANK

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency	Date: May 2021
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 6: *RDT&E Management Support*	**R-1 Program Element (Number/Name)** PE 0605502C / *Small Business Innovation Research - MDA*

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	-	107.824	0.000	0.000	-	0.000	-	-	-	-	-	-
MD45: *Small Business Innovation Research*	-	107.824	0.000	0.000	-	0.000	-	-	-	-	-	-

Program MDAP/MAIS Code: 362

Note

Funds are transferred into this PE in the execution year.

A. Mission Description and Budget Item Justification

Small Business Innovation Research (SBIR) explores innovative concepts pursuant to Public Law 106-554 (Small Business Reauthorization Act of 2000) and Public Law 107-50 (Small Business Technology Transfer Program Reauthorization Act of 2001), which mandates a two-phase competition for small businesses with innovative technology that can be commercialized. SBIR and Small Business Technology Transfer (STTR) programs will develop new dual-use technology for future Missile Defense Agency (MDA) Missile Defense Systems (MDS) needs. Dual-use means that the technology will be judged on the potential for future private sector investment both as a vehicle for reducing development time and cost, unit costs of new BMDS technology, and as a route to national economic growth through new commercial products. MDA will conduct the competition, award, and manage the contracts.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	107.824	0.000	0.000	-	0.000
Total Adjustments	107.824	0.000	0.000	-	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	107.824	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	0.000	0.000	0.000	-	0.000

Change Summary Explanation

FY 2020 funds were transferred to SBIR/STTR from other Program Elements in accordance with the SBIR/STTR Reauthorization Act of 2011.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605502C / *Small Business Innovation Research - MDA*	Project (Number/Name) MD45 / *Small Business Innovation Research*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD45: *Small Business Innovation Research*	-	107.824	0.000	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

Small Business Innovation Research (SBIR) explores innovative concepts pursuant to Public Law 106-554 (Small Business Reauthorization Act of 2000) and Public Law 107-50 (Small Business Technology Transfer Program Reauthorization Act of 2001), which mandates a two-phase competition for small businesses with innovative technology that can be commercialized. SBIR and Small Business Technology Transfer (STTR) programs will develop new dual-use technology for future Missile Defense Agency (MDA) Missile Defense Systems (MDS) needs. Dual-use means that the technology will be judged on the potential for future private sector investment both as a vehicle for reducing development time and cost, unit costs of new MDS technology, and as a route to national economic growth through new commercial products. MDA will conduct the competition, award, and manage the contracts.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: Small Business Innovation Research - MDA	107.824	0.000	0.000
Articles:	-	-	-
Description: Small Business Innovation Research (SBIR) explores innovative concepts pursuant to Public Law 106-554 (Small Business Reauthorization Act of 2000) and Public Law 107-50 (Small Business Technology Transfer Program Reauthorization Act of 2001), which mandates a two-phase competition for small businesses with innovative technology that can be commercialized. SBIR and Small Business Technology Transfer (STTR) programs will develop new dual-use technology for future Missile Defense Agency (MDA) Missile Defense Systems (MDS) needs. Dual-use means that the technology will be judged on the potential for future private sector investment both as a vehicle for reducing development time and cost, unit costs of new MDS technology, and as a route to national economic growth through new commercial products. MDA will conduct the competition, award, and manage the contracts.			
FY 2021 Plans: SEE ABOVE			
FY 2022 Plans: SEE ABOVE			
FY 2021 to FY 2022 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 6	**R-1 Program Element (Number/Name)** PE 0605502C / *Small Business Innovation Research - MDA*	**Project (Number/Name)** MD45 / *Small Business Innovation Research*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
N/A			
Accomplishments/Planned Programs Subtotals	107.824	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

THIS PAGE INTENTIONALLY LEFT BLANK

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency												Date: May 2021
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 6: *RDT&E Management Support*					R-1 Program Element (Number/Name) PE 0901598C *I Management HQ - MDA*							
COST ($ in Millions)	**Prior Years**	**FY 2020**	**FY 2021**	**FY 2022 Base**	**FY 2022 OCO**	**FY 2022 Total**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Cost To Complete**	**Total Cost**
Total Program Element	255.945	27.065	26.902	24.102	-	24.102	-	-	-	-	-	-
MD38: *Management Headquarters*	255.945	27.065	26.902	24.102	-	24.102	-	-	-	-	-	-
Program MDAP/MAIS Code: 362												

Note

The Management Headquarters Activity (MHA) Program Element (PE) 0901598C includes decreases in accordance with Department of Defense (DoD) reform efforts to maintain major headquarter activities' civilian staffing at reduced levels. DoD efforts to establish a common MHA framework resulted in a net funding decrease due to the transfer of civilian manpower performing functions Missile Defense Agency (MDA)considered MHA in prior years. Funding and civilian manpower performing these non-MHA functions were appropriately transferred to Program Wide Support (PWS).

A. Mission Description and Budget Item Justification

As prescribed by DoD Instruction 5100.73 Major Headquarters Activities, MDA's Management Headquarters PE supports the operation of MDA's management headquarters activities. This program element funds government civilian salaries and benefits, travel, contract support services, and operations of non-fielded activities.

Management Headquarters Activities provide executive leadership planning, develop centralized agency policy, prepare and defend annual budget submissions, respond to external inquiries, and implement Secretary of Defense (SECDEF) and Presidential priorities. As a DoD research, development and acquisition agency, the Headquarters Activities provide cost efficient oversight, direction, and control of initiatives and processes that assure best value, high quality, on-time, and successful performance of MDA acquisition programs. This is accomplished by ensuring acquisition and procurement program management emphasizes systems engineering; incorporates life cycle management objectives; implements risk management; and assesses cost, schedule or performance trade-offs.

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	27.065	26.902	26.708	-	26.708
Current President's Budget	27.065	26.902	24.102	-	24.102
Total Adjustments	0.000	0.000	-2.606	-	-2.606
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Missile Defense Agency				Date: May 2021	
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 6: *RDT&E Management Support*		R-1 Program Element (Number/Name) PE 0901598C *I Management HQ - MDA*			
• Other Adjustment	0.000	0.000	-2.606	-	-2.606

Change Summary Explanation

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency			Date: May 2021
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0901598C / *Management HQ - MDA*	Project (Number/Name) MD38 / *Management Headquarters*	

COST ($ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
MD38: *Management Headquarters*	255.945	27.065	26.902	24.102	-	24.102	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The Management Headquarters Activity (MHA) Program Element (PE) 0901598C includes decreases in accordance with Department of Defense (DoD) reform efforts to maintain major headquarter activities' civilian staffing at reduced levels. DoD efforts to establish a common MHA framework resulted in a net funding decrease due to the transfer of civilian manpower performing functions Missile Defense Agency (MDA) considered MHA in prior years.

A. Mission Description and Budget Item Justification

The MDA Headquarters provides oversight, direction and control over MDA's acquisition programs and fielded systems. The MDA Headquarters staff functions (government salaries, government travel, and contract support services) support the mission and operations of the world-wide MDA mission.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
Title: MHA Civilian Salaries	18.051	17.657	15.194
Articles:	-	-	-
Description: Provide mission support, oversight, and management of: - Acquisition, implementation of international initiatives to increase missile defense coverage to deployed forces and allies, efficiency-oriented administrative services, business operations, financial resources, human capitol, general counsel, internal review, public affairs, and media release. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** Decrease from FY 2021 to FY 2022 reflects civilian manpower efficiencies.			
Title: MHA Travel	0.925	0.906	0.423
Articles:	-	-	-
Description: Provide mission essential government travel.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Missile Defense Agency		Date: May 2021
Appropriation/Budget Activity 0400 / 6	**R-1 Program Element (Number/Name)** PE 0901598C / *Management HQ - MDA*	**Project (Number/Name)** MD38 / *Management Headquarters*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022
FY 2021 Plans: - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Title: MHA Contract Services	8.089	8.339	8.485
Articles:	-	-	-
Description: Provide contract support services to mission activities for acquisition, business operations, internal review, general counsel, administrative support and public affairs. Specific and/or unique accomplishments to each FY are as follows: ***FY 2021 Plans:*** - SEE ABOVE. ***FY 2022 Plans:*** - SEE ABOVE. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** N/A			
Accomplishments/Planned Programs Subtotals	27.065	26.902	24.102

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A