Department of Defense
Fiscal Year (FY) 2019 Budget Estimates

February 2018

Defense Threat Reduction Agency

Defense-Wide Justification Book Volume 5 of 5

Research, Development, Test & Evaluation, Defense-Wide

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Appropriation: RDT&E, Defense-Wide **Date: February 2018**

OVERVIEW

The Defense Threat Reduction Agency (DTRA) supports the nation's only Research, Development, Test & Evaluation (RDT&E) program focused specifically on combating and countering the threats posed by weapons of mass destruction (WMD), improvised explosive devices (IEDs), and asymmetric techniques, tactics, and procedures. These threats present immediate, persistent, and evolving risks for our nation's security. Mitigating these risks is a primary DoD priority, and the mission of DTRA. The Agency accomplishes this mission by safeguarding the United States and its allies from WMD, IEDs, and other improvised threats, by integrating, synchronizing, and providing responsive expertise, technologies, and capabilities.

The RDT&E budget funds research and capability development activities supporting efforts across the spectrum of chemical, biological, radiological, nuclear, and high-yield explosives (CBRNE) mission space. These efforts meet critical requirements in addressing strategic, operational, and technical challenges associated with WMD surveillance, detection, defeat, prevention, nonproliferation, counterproliferation, consequence management, and monitoring and verification.

The RDT&E portfolio addresses threat-specific technology development as well as number of enabling capabilities. These enabling capabilities include a Basic Research initiative that balances the imperatives of unconstrained exploration, discovery, and experimentation with near- and mid-term priorities arising because of continuously evolving threat environments. This portfolio seeks to facilitate innovative solutions and revolutionary technologies that transition to cost effective threat reduction and defeat capabilities. These enablers also include cutting-edge information science, advanced analytic, and modeling and simulation capabilities, while providing operational, near real-time decision support and technical integration. The RDT&E portfolio also supports end-to-end test event planning, management, safe execution, and results analysis supporting DoD, federal agencies, and friendly nations' programs to counter WMD proliferation and IEDs.

The nuclear technology development portfolio focuses on researching, developing, and demonstrating technologies that support a safe, secure, and effective U.S. nuclear deterrent and prevent nuclear or radiological attacks against the U.S. or its allies. This portfolio addresses nuclear weapons effects for targeting, consequences of execution, and survivability through the development of specific technical capabilities, to include improved modeling and information sharing tools. It also develops survivability standards and technology, and conducts relevant testing activities. Detection and post-detonation nuclear forensics remain significant challenges to security, driving investments in detecting, characterizing and monitoring nuclear and radiological threats and attributing nuclear explosions.

A portfolio focused on countering WMD and improvised threat technologies seeks to develop, demonstrate, and transition innovative technologies and capabilities to actively counter the full spectrum of CBRNE threats. These efforts range from applied research through integration and demonstration of capabilities for specific combat support needs. Specific areas of emphasis include weapons effects and planning, target sensing and characterization technologies, and agent defeat. This portfolio develops the innovative technologies to support WMD sensing and intelligence, surveillance and reconnaissance (ISR) capabilities. This portfolio also integrates many capabilities to address the challenges of characterization and defeat of hardened, deeply-buried targets.

DTRA continually assesses the total RDT&E program with respect to strategic direction, new and emerging requirements, and the current and future threat environment and optimizes it to address requirements while mitigating appropriate risk. This submission focuses on addressing increasing demands for combatant command-specific support to the warfighter; increasing investment in maintaining our organic test infrastructure; continued efforts to leverage collaborative partnerships, particularly with respect to innovative capabilities; and the continued need to balance technical advancement, existing and emerging requirements, and the resources available to meet these challenges. This submission incorporates the request for research and development resources for the Joint Improvised-Threat Defeat Organization previously requested through the Joint Improvised-Threat Defeat Fund appropriation.

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Department of Defense
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

25 Jan 2018

Appropriation	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO
Research, Development, Test & Eval, DW	460,982	469,957	469,957		
Total Research, Development, Test & Evaluation	460,982	469,957	469,957		

Department of Defense
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25 Jan 2018

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Research, Development, Test & Eval, DW				469,957		469,957
Total Research, Development, Test & Evaluation				469,957		469,957

Department of Defense
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

25 Jan 2018

Appropriation	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Research, Development, Test & Eval, DW	517,188	256,316	773,504
Total Research, Development, Test & Evaluation	517,188	256,316	773,504

Department of Defense
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
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25 Jan 2018

Summary Recap of Budget Activities	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO
Basic Research	34,623	37,201	37,201		
Applied Research	151,028	157,908	157,908		
Advanced Technology Development	260,396	268,607	268,607		
Advanced Component Development And Prototypes					
System Development And Demonstration	4,479	6,241	6,241		
Management Support	10,456				
Total Research, Development, Test & Evaluation	460,982	469,957	469,957		
Summary Recap of FYDP Programs					
Research and Development	460,982	469,957	469,957		
Total Research, Development, Test & Evaluation	460,982	469,957	469,957		

R-119PB: FY 2019 President's Budget (Published Version), as of January 25, 2018 at 08:21:17

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Advanced Component Development And Prototypes						
System Development And Demonstration				6,241		6,241
Management Support						
Total Research, Development, Test & Evaluation				469,957		469,957
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Summary Recap of Budget Activities	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Basic Research	37,023		37,023
Applied Research	161,151		161,151
Advanced Technology Development	299,858	13,648	313,506
Advanced Component Development And Prototypes	12,993	242,668	255,661
System Development And Demonstration	6,163		6,163
Management Support			
Total Research, Development, Test & Evaluation	517,188	256,316	773,504

Summary Recap of FYDP Programs			
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Total Research, Development, Test & Evaluation				469,957		469,957

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Total Research, Development, Test & Evaluation	517,188	256,316	773,504

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	Sec
1	0601000BR	DTRA Basic Research	01	34,623	37,201	37,201			U
		Basic Research		34,623	37,201	37,201			
20	0602718BR	Counter Weapons of Mass Destruction Applied Research	02	151,028	157,908	157,908			U
		Applied Research		151,028	157,908	157,908			
26	0603134BR	Counter Improvised-Threat Simulation	03						U
27	0603160BR	Counter Weapons of Mass Destruction Advanced Technology Development	03	260,396	268,607	268,607			U
		Advanced Technology Development		260,396	268,607	268,607			
94	0604134BR	Counter Improvised-Threat Demonstration, Prototype Development, and Testing	04						U
		Advanced Component Development And Prototypes							
122	0605000BR	Counter Weapons of Mass Destruction Systems Development	05	4,479	6,241	6,241			U
		System Development And Demonstration		4,479	6,241	6,241			
153	0605502BR	Small Business Innovation Research	06	10,456					U
		Management Support		10,456					
Total Research, Development, Test & Eval, DW				460,982	469,957	469,957			

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1	0601000BR	DTRA Basic Research	01				37,201		37,201	U
		Basic Research					37,201		37,201	
20	0602718BR	Counter Weapons of Mass Destruction Applied Research	02				157,908		157,908	U
		Applied Research					157,908		157,908	
26	0603134BR	Counter Improvised-Threat Simulation	03							U
27	0603160BR	Counter Weapons of Mass Destruction Advanced Technology Development	03				268,607		268,607	U
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		Basic Research		37,023		37,023	
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		Applied Research		161,151		161,151	
26	0603134BR	Counter Improvised-Threat Simulation	03		13,648	13,648	U
27	0603160BR	Counter Weapons of Mass Destruction Advanced Technology Development	03	299,858		299,858	U
		Advanced Technology Development		299,858	13,648	313,506	
94	0604134BR	Counter Improvised-Threat Demonstration, Prototype Development, and Testing	04	12,993	242,668	255,661	U
		Advanced Component Development And Prototypes		12,993	242,668	255,661	
122	0605000BR	Counter Weapons of Mass Destruction Systems Development	05	6,163		6,163	U
		System Development And Demonstration		6,163		6,163	
153	0605502BR	Small Business Innovation Research	06				U
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Total Research, Development, Test & Eval, DW				517,188	256,316	773,504	

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System Development And Demonstration				4,479	6,241	6,241			
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	Applied Research						157,908		157,908	
26	0603134BR	Counter Improvised-Threat Simulation	03							U
27	0603160BR	Counter Weapons of Mass Destruction Advanced Technology Development	03				268,607		268,607	U
	Advanced Technology Development						268,607		268,607	
94	0604134BR	Counter Improvised-Threat Demonstration, Prototype Development, and Testing	04							U
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122	0605000BR	Counter Weapons of Mass Destruction Systems Development	05				6,241		6,241	U
	System Development And Demonstration						6,241		6,241	
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	Applied Research			161,151		161,151	
26	0603134BR	Counter Improvised-Threat Simulation	03		13,648	13,648	U
27	0603160BR	Counter Weapons of Mass Destruction Advanced Technology Development	03	299,858		299,858	U
	Advanced Technology Development			299,858	13,648	313,506	
94	0604134BR	Counter Improvised-Threat Demonstration, Prototype Development, and Testing	04	12,993	242,668	255,661	U
	Advanced Component Development And Prototypes			12,993	242,668	255,661	
122	0605000BR	Counter Weapons of Mass Destruction Systems Development	05	6,163		6,163	U
	System Development And Demonstration			6,163		6,163	
153	0605502BR	Small Business Innovation Research	06				U
	Management Support						
Total Defense Threat Reduction Agency				517,188	256,316	773,504	

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Line #	Budget Activity	Program Element Number	Program Element Title	Page
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Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

Line #	Budget Activity	Program Element Number	Program Element Title	Page
20	02	0602718BR	*Counter Weapons of Mass Destruction Applied Research	Volume 5 - 7

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
26	03	0603134BR	Counter Improvised-Threat Simulation	Volume 5 - 33
27	03	0603160BR	*Counter Weapons of Mass Destruction Advanced Technology Development	Volume 5 - 37

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Line #	Budget Activity	Program Element Number	Program Element Title	Page
94	04	0604134BR	Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing	Volume 5 - 63

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
122	05	0605000BR	*Counter Weapons of Mass Destruction Systems Development	Volume 5 - 89

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Line #	Budget Activity	Program Element Number	Program Element Title	Page
153	06	0605502BR	Small Business Innovation Research	Volume 5 - 99

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Program Element Title	Program Element Number	Line #	BA	Page
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*Counter Weapons of Mass Destruction Applied Research	0602718BR	20	02	Volume 5 - 7
*Counter Weapons of Mass Destruction Systems Development	0605000BR	122	05	Volume 5 - 89
*DTRA Basic Research	0601000BR	1	01	Volume 5 - 1
Counter Improvised-Threat Simulation	0603134BR	26	03	Volume 5 - 33
Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing	0604134BR	94	04	Volume 5 - 63
Small Business Innovation Research	0605502BR	153	06	Volume 5 - 99

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ACRONYMS

AA-HPRT	Analytics Hard Problem Research Team
ACES	Arms Control Enterprise System
AD	Agent Defeat
ADMB	Agent Defeat Modeling and Simulation Baseline
AEHF	Advanced Extremely High Frequency
AFX	Air Force Explosive
AI	Active Interrogation
ANTS	Attack the Network Tool Suite
AOR	Area of Responsibility
ARAT	Adversarial Route Analysis Tool
ARIEL	Autonomous Reconnaissance Infrared Electro-optical Loitering
ASIC	Application Specific Integrated Circuit
ATAC	Advanced Targeting Assessment Capability
ATAK	Android Tactical Assault Kit
ATD	Advanced Technology Development
AUV	Autonomous Underwater Vehicle
AWE	Atomic Weapons Establishment
BAA	Broad Agency Announcement
BDA	Battle Damage Assessment
BDI	Battle Damage Information
BICES	Battlefield Information Collection and Exploitation System
BLADE	BDI Link Advanced Demonstrator
BLU	Bomb, Live Unit
C4I	Command, Control, Communications, Computers, and Intelligence
CANES	Consolidated Afloat Network and Enterprise Services

CAPE	Cost Assessment and Program Evaluation
CARDS	CBRN Air-droppable Remotely Deployed Sensor System Cost Analysis Tool for Test Site
C-B	Chemical-Biological
CBP	Customs and Border Protection
CBRNE	Chemical, Biological, Radiological, Nuclear, and High-yield Explosives
CCDR	Combatant Commander
CFD	Computational Fluid Dynamics
CHAMP	Counter Electronics High Power Microwave Advanced Missile Project
CJCS	Chairman, Joint Chiefs of Staff
CNDSP	Computer Network Defense Service Provider
CMOS	Complementary metal-oxide semiconductor
CCMD	Combatant Command
COE	Consequence of Execution
CoE-NI	Consequence of Execution – Nuclear Integration
COI	Community of Interest
CONOPS	Concept of Operations
CONUS	Continental United States
COOP	Continuity of Operations
COP	Common Operating Picture
CP	Counter-proliferation
CPGS	Conventional Prompt Global Strike
C-sUAS	Counter-Small Unmanned Aerial Systems
CSM	Computational Structure Mechanics
CTBT	Comprehensive Nuclear Test Ban Treaty
CT/CP	Counterterrorism / Counterproliferation
CTS	Component Test Structure
CTTS	CBRNE Tactical Training System
C-UAS	Counter- Unmanned Aerial System

C-WAC	Counter-WMD Analysis Center
CWMD	Countering Weapons of Mass Destruction
CWMD-T	Combating Weapons of Mass Destruction –Terrorism
DAPSS	Denied Area Persistent Sensor System
DEL	DTRA Experimentation Lab
DHS	Department of Homeland Security
DIAMONDS	Defense Integration and Management of Nuclear Data Services
DIOCC/DIA	Defense Intelligence Operations Coordination Center/Defense Intelligence Agency
DITEC	DTRA Integration Technical Experimentation Center
DoD	Department of Defense
DO	DISCREET OCULUS
DOE	Department of Energy
DOJ	Department of Justice
DPG	Dugway Proving Ground
DPPG	Defense Policy and Planning Guidance
DRDC	Defence Research and Development Canada
DSCS	Defense Satellite Communications System
DTRA	Defense Threat Reduction Agency
DT&E	Development, Test, and Evaluation
ECBC	Edgewood Chemical Biological Center
EDTC	Engineering and Development Test Center
EM-1	Capabilities of Nuclear Weapons: Effects Manual Number 1
EMP	Electromagnetic Pulse
EMREP	Electromagnetic Reliability and Effects Predictions
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
FEFLO	Finite Element Flow Solver
FFRDC	Federally Funded Research and Development Center

FinFets	Fin-Shaped Field Effect Transistors
FITS	Forensics Inversion Tool Suite
FOC	Full Operational Capability
FREAK	Force-on-Force Evaluation and Analysis of Key Performance Parameters
FYDP	Future Years Defense Program
GCC	Global Command and Control
GEF	Guidance for Employment of the Force
GKMC	Global Knowledge Management System
GSA	Global Situational Awareness
GSM	Global System for Mobile Communications
GUI	Graphical User Interface
HAMMER	Heated and Mobile Munitions Employing Rockets
HANE	High Altitude Nuclear Environments
HARP	High Altitude Radiological Phenomenology
HDBT	Hard and Deeply Buried Target
HEBX	Hybridized Enhanced Blast Explosive
HEMP	High Altitude Electro Magnetic Pulse
HENRE	Health Effects from Radiological and Nuclear Environments
HPAC	Hazard Prediction and Assessment Capability
HPC	High Performance Computing
HPCMP	High Performance Computing Modernization Program
HTD	Hard Target Defeat
IBRD	Interagency Biological Restoration Demonstration
ICEPIC	Improved Concurrent Electromagnetic Particle-in-Cell
IED	Improvised Explosive Device
IMAAC	Interagency Modeling and Atmospheric Assessment Center
IMEA	Integrated Munitions Effects Assessment
IMS	International Monitoring System

IOC	Initial Operational Capability
IPODS	Integrated Precision Ordnance Delivery System
ISIS	Integrated Stand-off Inspection System
ISR	Intelligence, Surveillance, Reconnaissance
ISS	Integrated Sensor System
IR	Infrared
IT	Information Technology
ITD	Integrated Technology Demonstration
IWMDT	Integrated Weapons of Mass Destruction Toolset
JAIEG	Joint Atomic Information Exchange Group
JCAM	Joint Collaborative Analysis Model
JCDE	Joint Concept Development & Experimentation
JCIDS	Joint Capabilities Integration and Development System
JCTD	Joint Concept Technology Demonstration
JDAM	Joint Direct Attack Munition
JEM	Joint Effects Model
JMEWS	Joint Multi-Effects Warhead System
JSAF	Joint Semi-Automated Forces
JWICS	Joint Worldwide Intelligence Communications System
KAFB	Kirtland Air Force Base
keV	kilo-electronvolt
LAMP	Loop-mediated isothermal Amplification
LCP	Large Caliber Penetrator
LLE	Laboratory for Laser Energetics
LLNL	Lawrence Livermore National Laboratory
LTS	Large Test Structure
MACS	Modular Autonomous Countering WMD System
MAGICS	Modular Airborne Gaseous Isotope Collection System

MASS	MILSATCOM Atmospheric Scintillation Simulator
MCNP	Monte Carlo N-Particle
MDA	Missile Defense Agency
NLAN	Non-Classified Local Area Network
OIR	Operation Inherent Resolve (Iraq)
RS	Resolute Support (Afghanistan)
sUAS	Small Unmanned Aerial Systems
SSE	Sensitive Site Exploitation
TWAC	Targeting and Weaponeering Analysis Cell
TXL	Transportable Xenon Laboratory
UAS	Unmanned Aerial Systems
UCP	Unified Command Plan
UGF	Underground Facility
UGT	Underground Test
UHPC	Ultra-High Performance Concrete
UK	United Kingdom
USANCA	U.S. Army Nuclear and Combating WMD Agency
USEUCOM	U.S. European Command
USFK	U.S. Forces Korea
USG	United States Government
USPACOM	U.S. Pacific Command
USPDS	U.S. Prompt Diagnostics System
UTAS	Underground Targeting and Analysis System
VAPO	Vulnerability Assessment Protection Option
VEO	Violent Extremist Organization
VIRTUS	Virtual Radiation Training through Ubiety System
VMS	Virtual Management System
VOIP	Voice Over Internet Protocol

WACS	WMD Aerial Collection System
WCF	West Coast Facility
WEP	Weapon Effects Phenomenology
WESC	Weapon Effects Steering Committee
WMD	Weapons of Mass Destruction
WSMR	White Sands Missile Range

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Defense Threat Reduction Agency	Date: February 2018
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 1: *Basic Research*	**R-1 Program Element (Number/Name)** PE 0601000BR / **DTRA Basic Research*

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	254.315	34.623	37.201	37.023	-	37.023	37.229	38.265	39.290	40.117	Continuing	Continuing
RU: *Basic Research for Countering WMD*	254.315	34.623	37.201	37.023	-	37.023	37.229	38.265	39.290	40.117	Continuing	Continuing

A. Mission Description and Budget Item Justification

Defense Threat Reduction Agency (DTRA) Basic Research funds support research across physical, material, engineering, computational, and life sciences directed toward increased knowledge and understanding of the fundamental aspects of observable phenomena associated with the threats posed by weapons of mass destruction (WMD).

DTRA's Basic Research effort is the Nation's only basic research portfolio solely dedicated to countering weapons of mass destruction (CWMD). It provides for the discovery and development of basic knowledge by research performers from academia and world-class research institutions in government and industry. This investment helps motivate the scientific community to conduct research benefiting WMD-related defense missions, advancing the body of CWMD knowledge, and improving knowledge of research efforts that support nonproliferation, counter proliferation, and consequence management. These efforts are closely coordinated with DTRA's Chemical and Biological Technologies Department, which executes a basic research portfolio under DoD's Chemical and Biological Defense Program.

Each year, program and technical managers conduct formal assessments of the portfolio, leveraging deep Science and Technology (S&T) expertise within DTRA, as well as from the Defense Basic Research Advisory Group, independent external panel reviews, and other CWMD-focused stakeholders. This coordination facilitates unique, CWMD-relevant basic research while eliminating unintended duplication of effort in the broader defense S&T community.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	35.436	37.201	37.340	-	37.340
Current President's Budget	34.623	37.201	37.023	-	37.023
Total Adjustments	-0.813	0.000	-0.317	-	-0.317
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.813	-			
• Economic Assumptions	-	-	-0.317	-	-0.317

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Defense Threat Reduction Agency	Date: February 2018
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 1: *Basic Research*	**R-1 Program Element (Number/Name)** PE 0601000BR / **DTRA Basic Research*

Change Summary Explanation

The decrease in FY 2019 is due to the impact of lower economic assumptions for inflation. The funding level in this program element continues to reflect the impact of incremental Service Requirement Review Board reductions, as part of the Department of Defense reform agenda, for consolidation and reduction of service contracts.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 1	R-1 Program Element (Number/Name) PE 0601000BR / *DTRA Basic Research	Project (Number/Name) RU / *Basic Research for Countering WMD*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RU: *Basic Research for Countering WMD*	254.315	34.623	37.201	37.023	-	37.023	37.229	38.265	39.290	40.117	Continuing	Continuing

Note

Prior year funds are related to this project in program element 0602718BR.

A. Mission Description and Budget Item Justification

The Basic Research for Countering WMD project, as the nation's only basic research portfolio solely dedicated to countering weapons of mass destruction (CWMD), is a core strategic investor in future scientific and technological progress across the full spectrum of the Defense Threat Reduction Agency's (DTRA's) CWMD mission areas. This project concentrates on high risk, high-payoff basic research, leveraging world-class expertise in academia, government, and industry, to increase the foundational body of scientific knowledge supporting DTRA's Applied Research and Advanced Technology Development projects.

This project aligns with DTRA's strategic objectives that support policy and planning guidance from the Office of the President, the Department of Defense (DoD), and the broader WMD threat reduction community. The portfolio addresses this guidance through capability enhancements, projects, and Science and Technology (S&T) investments that support CWMD and reduce global nuclear dangers. Specifically, they include: accelerating the development of standoff radiological/nuclear detection capabilities; researching countermeasures and defenses to non-traditional agents; enhancing nuclear forensics; securing vulnerable materials; developing new verification technologies; developing an in-depth understanding of the capabilities, values, intent, and decision making of potential adversaries, whether they are states, networks, or individuals; defeating WMD agents; researching biologically-based and inspired materials for DoD applications; and leveraging science, technology, and innovation through domestic and international partnerships and agreements.

This project solicits, coordinates, and conducts research to build a robust, forward-looking fundamental research portfolio targeting strategic, mission-focused, basic research with high potential impact for CWMD. The research projects are selected for scientific merit, technical quality, and the potential for innovation. Each individual research project offers opportunities to expand the knowledge base to help the warfighter, to bring to bear new science solutions with a fresh approach, or to leverage revolutionary approaches to technical surprise, building a foundation for future CWMD solutions. This research will enable new capabilities to: better understand the environment, threats and vulnerabilities; control, defeat, disable, and/or dispose of WMD threats; and safeguard the force by managing consequences. Each program manager's portfolio leverages a wide range of scientific disciplines, including physics, chemistry, biology, mathematics, information and network sciences and focuses basic research on the CWMD mission.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: Project RU: Basic Research for Countering WMD	34.623	37.201	37.023
Description: Project RU funds the exploration and discovery of fundamental scientific knowledge related to DTRA's CWMD mission by research performers from academia, government, and industry.			
FY 2018 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 1	**R-1 Program Element (Number/Name)** PE 0601000BR / **DTRA Basic Research*	**Project (Number/Name)** RU / *Basic Research for Countering WMD*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
- Shape and oversee the CWMD Basic Research portfolio, comprised of approximately 150 active basic research awards on a three to five year cycle. This portfolio continues to address the DoD priority on CWMD science and technology, and supports specific priorities on Autonomy, Data-driven Decisions, Electronic Protection, System Resiliency and other emerging areas of interest. - Support world-class talent in WMD research at universities and laboratories to bolster the development of the future Science, Technology, Engineering, and Mathematics workforce. - Assess entire CWMD Basic Research portfolio on an annual basis. - Assure progress toward technical objectives and support collaborative relationships within the scientific community through an annual technical review of each grant to assess scientific advancement. - Assess the focus and scope of the program related to CWMD challenges and assess the coordination of CWMD basic research across the DoD mission space and the broader basic research community to avoid duplication and ensure successful partnerships via an External Panel Review. ***FY 2019 Plans:*** - Manage and steer the CWMD Basic Research portfolio, comprised of approximately 150 active basic research awards on three- to five-year cycles. This portfolio continues to address DoD CWMD science and technology requirements, supporting specific priorities focused on current and emerging areas of interest. - Support collaborative relationships within the scientific community and ensure progress toward technical objectives through an annual technical review of each grant to assess scientific advancement. - Support the development of world-class talent in WMD research at universities and laboratories to foster the future Science, Technology, Engineering, and Mathematics workforce. - Conduct an Internal Portfolio Review to assess the focus and scope of the portfolio related to CWMD challenges and assess the coordination of CWMD basic research across the DoD mission space and the broader basic research community to avoid duplication and ensure successful partnerships. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change.			
Accomplishments/Planned Programs Subtotals	34.623	37.201	37.023

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

*Prior year funds are related to this project in program element 0602718BR.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 1	**R-1 Program Element (Number/Name)** PE 0601000BR / **DTRA Basic Research*	**Project (Number/Name)** RU / *Basic Research for Countering WMD*

D. Acquisition Strategy

Procurement methods include competitive selection awards through DTRA's Broad Agency Announcement and collaborative funding through other organizations.

E. Performance Metrics

Project performance is measured via a combination of statistics including the number of publications generated, number of students trained in sciences and engineering supporting DoD educational goals, number of participating research organizations, and percentage of awards transitioned to other programs for further development.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Defense Threat Reduction Agency	Date: February 2018
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 2: *Applied Research*	**R-1 Program Element (Number/Name)** PE 0602718BR / **Counter Weapons of Mass Destruction Applied Research*

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	959.906	151.028	157.908	161.151	-	161.151	163.576	165.678	165.879	170.045	Continuing	Continuing
RA: *Information Sciences and Applications*	189.420	35.048	30.270	31.830	-	31.830	29.977	30.167	30.412	31.270	Continuing	Continuing
RD: *Detection Technologies*	15.083	14.570	14.769	16.860	-	16.860	18.287	17.520	17.875	18.249	Continuing	Continuing
RE: *Counter-Terrorism Technologies*	8.472	0.099	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
RF: *Forensics Technologies*	207.133	9.176	10.274	10.257	-	10.257	10.466	10.675	10.894	11.123	Continuing	Continuing
RG: *Defeat Technologies*	86.028	10.428	11.060	12.959	-	12.959	13.262	13.222	13.436	13.634	Continuing	Continuing
RI: *Nuclear Survivability*	129.182	30.085	34.103	32.732	-	32.732	33.723	34.479	32.915	33.841	Continuing	Continuing
RL: *Nuclear & Radiological Effects*	158.822	26.419	29.228	29.388	-	29.388	30.054	30.723	31.413	32.072	Continuing	Continuing
RM: *WMD Counterforce Technologies*	92.653	11.702	14.552	12.780	-	12.780	12.991	13.736	13.483	14.081	Continuing	Continuing
RR: *Countering WMD Test and Evaluation*	73.113	13.501	13.652	14.345	-	14.345	14.816	15.156	15.451	15.775	Continuing	Continuing

Note

*Program Element 0602718BR name changes from WMD Defeat Technologies to Counter Weapons of Mass Destruction Applied Research beginning in FY 2018.
**Project RR title changed from Combating WMD Test and Evaluation to Countering WMD Test and Evaluation beginning in FY 2017.

A. Mission Description and Budget Item Justification

The Defense Threat Reduction Agency (DTRA) Counter Weapons of Mass Destruction (WMD) Applied Research program element funds the expansion and application of basic scientific knowledge in order to develop novel materials, devices, systems, and methods supporting next generation concepts and technologies that enable advances in WMD surveillance, detection, defeat, prevention, nonproliferation, counterproliferation, consequence management, and treaty verification.

This Applied Research portfolio is aligned with strategic planning objectives and Science and Technology (S&T) investment direction established annually by DTRA. The objectives directly support policy and planning guidance from the Office of the President, the Department of Defense (DoD), and the broader WMD threat reduction community.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Defense Threat Reduction Agency	Date: February 2018
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 2: *Applied Research*	**R-1 Program Element (Number/Name)** PE 0602718BR / **Counter Weapons of Mass Destruction Applied Research*

The portfolio advances DTRA's Countering WMD (CWMD) mission by balancing the following imperatives: invest in DTRA's applied research capabilities and increase the CWMD technology base to maximize future pay-off; capitalize on opportunities to deliver innovative, cost-effective solutions to technical challenges that must be resolved prior to system-specific technology investigations and development; and ensure applied research efforts are directly aligned to mission-specific capability requirements of DTRA, the Military Departments, Combatant Commanders, other DoD and federal agencies, and international partners.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	154.857	157.908	160.417	-	160.417
Current President's Budget	151.028	157.908	161.151	-	161.151
Total Adjustments	-3.829	0.000	0.734	-	0.734
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.506	-			
• FFRDC	-0.323	-	-	-	-
• Realignments	-	-	-1.960	-	-1.960
• Programmatic Increase	-	-	4.000	-	4.000
• Economic Assumptions	-	-	-1.306	-	-1.306

Change Summary Explanation

The increase in FY 2019 is due to the net effect of increased investment to counter Improvised Explosive Device/small Unmanned Aerial Systems (IED/sUAS) (i.e., Tier 1 and 2 UAS, including rotary and fixed winged), a realignment of funding to program element 0603160BR for CWMD terrorism support, a realignment to DTRA's Operations and Maintenance portfolio in support of the Defense Threat Reduction Analysis Center (DTRIAC), and lower economic assumptions for inflation. The funding level in this program element continues to reflect the impact of incremental Service Requirement Review Board reductions, as part of the Department of Defense reform agenda, for consolidation and reduction of service contracts.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research	Project (Number/Name) RA / *Information Sciences and Applications*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RA: *Information Sciences and Applications*	189.420	35.048	30.270	31.830	-	31.830	29.977	30.167	30.412	31.270	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Information Sciences and Applications project develops concepts and technologies in the areas of high-speed information processing, modeling and simulation, signal detection, and data-driven decision analysis in support of the Defense Threat Reduction Agency's (DTRA's) technical reachback teams. This project develops and maintains continuously improving collaborative architectures and Chemical, Biological, Radiological, Nuclear and High-yield Explosives (CBRNE) modeling and simulation codes that drive an integrated suite of decision support tools serving the Combatant Commands, other Department of Defense (DoD) agencies, and national and international Countering Weapons of Mass Destruction (CWMD) partners. This effort funds research activities that benefit the public through analysis and engagement to reduce and counter the threats posed by WMD/Weapons of Mass Effects (WME) via the Project on Advanced Systems and Concepts for Countering WMD (PASCC). PASCC cultivates national and international research community partnerships across domains, brings scientific, technical, and social science faculty/ experts together, and looks ahead to help understand and anticipate WMD/WME capabilities and threats.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: RA: Information Sciences and Applications	35.048	30.270	31.830
Description: Project RA develops concepts and technologies in the areas of high speed information processing, modeling and simulation, signal detection, and data-driven decision analysis. ***FY 2018 Plans:*** - Continue to pursue methodologies and explore capabilities for enabling data collection, toolset automation, and distributed analysis / synthesis of emerging and disruptive technology information that supports the Technology-Driven WMD Threat Forecasting program. - Continue to develop data anomaly detection and analysis technology as part of DoD Distributed Common Ground/Surface System and Intelligence Community Information Technology Enterprise-compliant architectures. - Continue to develop enhancements to modeling, simulation, and data architecture capabilities for analysis of higher order effects from nuclear detonation, to include physical infrastructure, political, and economic impacts. - Continue maturation of DTRA Experimental Laboratory capabilities in support of whole-of-government CWMD research and development mission areas. - Enhance the software stack to include a minimum of two new nuclear effects phenomenology code capabilities in support of the Mission Planning Analysis System (MPAS) allowing the use of the user interface and web services to acquire effects assessments within the U.S. Strategic Command (USSTRATCOM) operational environment.			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / **Counter Weapons of Mass Destruction Applied Research*	**Project (Number/Name)** RA / *Information Sciences and Applications*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
-Initial integration and deployment of two new nuclear effect phenomenology codes for fire spread and electro-magnetic pulse (EMP) modeling within the Integrated Weapons of Mass Destruction Toolset (IWMDT) architecture to support the MPAS at US USSTRATCOM by providing prototype orchestrated effects modeling for combined effects. - Continue to develop high fidelity Force-on-Force (phenomenology and effects) computational modeling and simulation capabilities integrated with real and virtual sensor responses. - Continue to conduct a large-scale test series interagency on dense gas release and to develop enhancement of models to improve atmospheric hazard predictions; improvement of models reduces uncertainty of analyses used by staff planners and first responders. Develop enhancements and modifications to codes supporting analysis of test results. - Complete development of environmental degradation parameters of airborne non-traditional chemical agents to characterize collateral effects after a strike on a WMD facility; improvement of models reduces uncertainty in collateral effects from WMD in support of combat operations. - Continue to develop and integrate a CWMD sensor framework in collaboration with the Night Vision Laboratory and Common CBRN Sensor Interface sponsors (DTRA's Nuclear Technologies and Counterterrorism Technologies Divisions and the Joint Program Executive Office for Chemical and Biological Defense) to enable real-time data fusion of deployed sensors with modeling and simulation tools. - Continue to develop and enhance high fidelity radiation detection training applications for use in mobile devices. - Continue to develop augmented reality displays for mobile devices to enable training with virtual radiation source surrogates. - Continue to develop automated methods to consolidate multiple geospatial terrain types into a single virtual globe capable of supporting multiple modeling and simulation platforms. - Continue to develop mobile device-based route planning, force tracking, sensor integration, and geo-tagging applications to support warfighter- unique CWMD missions. - Continue to conduct a series of WMD studies via the Project on Advanced Systems and Concepts for Countering WMD (PASCC) and grant 20 to 25 research awards that support CWMD efforts.			
FY 2019 Plans: - Release software update for Force-on-Force Evaluation and Analysis of Key Performance Parameters (FREAK), which provides Integrated Force-on-Force Models for Course of Action Analysis, CONOPS Development, and Sensor Performance Prediction. - Release software update for Virtual Radiation Training through Ubiety System (VIRTUS), which provides a mobile phone based radiation sensor emulator for search training. - Release software update for Android Tactical Assault Kit (ATAK), which incorporates CWMD capabilities into a mobile phone based tactical common operating picture - for customers to support new, emerging and updated modeling and simulation requirements.			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / **Counter Weapons of Mass Destruction Applied Research*	**Project (Number/Name)** RA / *Information Sciences and Applications*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
- Continue to sustain a shared, rapidly configurable computational environment to serve as the common R&D backbone: core analytic tools, shared information, and applications. Provide analytic solutions and shared computations environments to support R&D and operational needs. - Transition analytic investments, including machine learning, natural language processing, and statistical analytics technologies to the common R&D backbone for agency wide access. - Improve decision making processes and time-to-decision cycles by researching, developing, integrating, deploying, and managing advanced data analytics, data visualizations, and knowledge management capabilities to support DTRA's and associated mission partners'/customers' validated operational capability requirements. - Establish and advise on approaches to leverage cloud-based capabilities to improve data access, interoperability, and policy compliance. Implement and enforce system designs to support compliance with DoD cybersecurity policies. - Further develop and implement a sustainable and scalable analytic capability to discover emerging and disruptive technologies in support of efforts to anticipate and meet new and emerging requirements. - Continue PASCC and grant 20 to 25 research awards that support CWMD efforts. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase from FY 2018 to FY 2019 is due to a revised acquisition strategy for cloud services and the realignment of High Performance Computing activities.			
Accomplishments/Planned Programs Subtotals	35.048	30.270	31.830

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 27/0603160BR: *Counter Weapons of Mass Destruction Advanced Technology Development*	18.102	10.229	11.286	-	11.286	11.480	11.752	12.005	12.258	Continuing	Continuing
• 153/0605502BR: *Small Business Innovation Research*	10.456	-	-	-	-	-	-	-	-	Continuing	Continuing

Remarks

D. Acquisition Strategy

Competitive selection of most appropriate performers to fulfill science and technology development needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / **Counter Weapons of Mass Destruction Applied Research*	**Project (Number/Name)** RA / *Information Sciences and Applications*

E. Performance Metrics

Percentage of CWMD technologies selected for transition to advanced technology development (6.3) and advanced component development and prototypes (6.4).

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research	Project (Number/Name) RD / *Detection Technologies*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RD: *Detection Technologies*	15.083	14.570	14.769	16.860	-	16.860	18.287	17.520	17.875	18.249	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Detection Technologies mission is to conduct Research, Development, Test, & Evaluation to (1) identify, develop, and exploit signatures associated with nuclear threats to advance U.S. capabilities to detect and interdict such threats; and (2) locate, identify, and track special nuclear material and improve detection factors such as range, time, sensitivity, and accuracy to enhance Service and Special Mission Unit capabilities. These efforts support Department of Defense (DoD) requirements for countering terrorism, counter/nonproliferation, countering rogue states, and homeland defense.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: RD: Detection Technologies	14.570	14.769	16.860
Description: Project RD develops direct and indirect technologies for the detection of radiation and non-radiative signatures associated with nuclear threats, and advances warfighter capabilities to rapidly locate, characterize, and counter such threats.			
FY 2018 Plans: - Continue to develop radiation and nuclear threat detection systems to identify the best performing technologies and techniques for transition to advanced technology development efforts. - Continue to develop technologies for next generation nuclear imaging devices with dual gamma and neutron imaging capability, enabling warfighters to rapidly pinpoint and identify detected radioisotopes. - Continue to develop technologies to enable interoperable architectures for enhanced, real-time mission analysis and user-defined operational pictures within a shared or distributed area of operations. - Continue to develop and integrate novel detection materials and advanced helium-3 replacement technologies into prototype radiation detection systems to increase range, sensitivity, and accuracy of detection and enable warfighters to rapidly locate targeted material. - Continue to develop, integrate, and demonstrate prototype radiation and nuclear threat detection algorithms, electronics and communications capabilities to enhance the range of detectability of targeted material. - Initiate investigation of computer learning and computer vision technologies to enhance nuclear threat situational awareness and nuclear threat identification. - Initiate investigation of various sensor capabilities for far-field identification and tracking of nuclear threats. - Identify exploitable observables to inform technology development and investigate emerging technologies that indicate the presence of nuclear threats.			
FY 2019 Plans: - Develop a contamination avoidance capability.			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / **Counter Weapons of Mass Destruction Applied Research*	**Project (Number/Name)** RD / *Detection Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
- Develop wearable neutron detectors made of Boron-Coated Straw in support of the development of modern, novel detector solutions to revolutionize CONOPs. - Develop detailed studies to systematically identify new nuclear threat signatures, breaking down the problem geographically to distinguish between allies and foes, and to determine assets and coverage. - Transition those technologies that demonstrate exceptional capabilities in radiation and nuclear threat detection to advanced technology development. - Develop tools for pre-detonation diagnostics, leveraging high spatial resolution nuclear imagers, multiplicity algorithms, trace analysis tools, and high-fidelity test objects to increase capability to characterize threats. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase from FY 2018 to FY 2019 is due to additional investment in radiation detection and nuclear threats detection, intelligence, surveillance, and reconnaissance to support technology development efforts for greater effectiveness of general purpose forces in a nuclear environment.			
Accomplishments/Planned Programs Subtotals	14.570	14.769	16.860

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 27/0603160BR: *Counter Weapons of Mass Destruction Advanced Technology Development*	16.608	17.556	26.021	-	26.021	27.110	28.170	28.867	29.472	Continuing	Continuing

Remarks

D. Acquisition Strategy

Competitive selection of most appropriate performers to fulfill science and technology development needs. Performer base includes best-of-breed researchers across the Department of Defense and other government agency laboratories, academia, industry and international partner organizations.

E. Performance Metrics

Percentage of CWMD technologies selected for transition to advanced technology development (6.3) and advanced component development and prototypes (6.4).

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research	Project (Number/Name) RE / *Counter-Terrorism Technologies*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RE: *Counter-Terrorism Technologies*	8.472	0.099	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Counter-Terrorism Technologies project is an over-arching project that develops and transitions a full spectrum of new technologies to counter emergent Weapons of Mass Destruction (WMD) thus enabling warfighters to improve their ability to detect, disable, interdict, neutralize, and destroy chemical, biological, nuclear production, storage, and weaponization facilities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: RE: Counter-Terrorism Technologies	0.099	-	-
Description: Project RE provides research and development (R&D) support to Joint U.S. Military Forces, specifically U.S. Special Operations Command (USSOCOM), in the areas of Explosive Ordnance Disposal Device Defeat; Counter WMD technologies for warfighters; the USSOCOM Countering WMD – Terrorism Support program.			
Accomplishments/Planned Programs Subtotals	0.099	-	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 27/0603160BR: *Counter Weapons of Mass Destruction Advanced Technology Development*	98.532	103.869	108.978	-	108.978	111.060	113.426	115.596	118.024	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

Number of technologies developed and delivered, and/or proof of concept, or successful Military Utility Assessments conducted that increase the potential mission success and reduce the number of current gaps in Special Operations Forces capabilities to counter weapons of mass destruction.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research	Project (Number/Name) RF / *Forensics Technologies*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RF: *Forensics Technologies*	207.133	9.176	10.274	10.257	-	10.257	10.466	10.675	10.894	11.123	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Forensics Technologies project develops post-detonation nuclear forensics technologies providing accurate, rapid, and reliable means to collect, analyze, and evaluate prompt data and debris from a nuclear or radiological event in support of exploitation and attribution efforts. These forensics technologies also enable the Defense Threat Reduction Agency (DTRA) and its trusted partners to detect, locate, identify, track, and interdict nuclear and radiological threats, including weapons and material and enablers to their acquisition and development. In accordance with Department of Defense Directive S-2060.04, DTRA serves as the U.S. Government lead for post-detonation National Technical Nuclear Forensics (NTNF) research and development (R&D). As the central NTNF R&D coordinator, DTRA works in consultation with interagency partners to develop and improve ground-based capabilities supporting exploitation and attribution missions.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: RF: Forensics Technologies	9.176	10.274	10.257
Description: Project RF develops post-detonation nuclear forensics technologies providing accurate, rapid and reliable means to collect, analyze, and evaluate prompt data and debris from a nuclear or radiological event in support of exploitation and attribution efforts. ***FY 2018 Plans:*** - Develop and evaluate new and improved prompt diagnostics, debris collection, analysis and diagnostics, and device modeling concepts and methodologies to support nuclear device reconstruction and decrease timelines for, lower uncertainty of, and increase confidence in technical nuclear forensics conclusions supporting attribution. - Engage with partner nations under appropriate international agreements to improve understanding of prompt phenomenology, modeling tools, and sensor technologies. - Develop and improve techniques and algorithms to analyze, combine, and integrate speed-of-light and speed-of-sound phenomena in an urban environment to increase the effectiveness and accuracy of nuclear detonation yield determinations and weapon characterizations. - Investigate and evaluate innovative ground-based prompt diagnostic sensor concepts and technologies, such as ubiquitous networks and sensors with reduced size, weight, and power consumption, to improve sensor portability and expand operational capability and flexibility. - Expand international collaboration in the areas of experiments and weapons modeling to improve device reconstruction tools and analysis. - Develop and evaluate new and improved validation and verification technologies and methodologies, such as surrogate debris and representative isotopes, to support post-detonation National Technical Nuclear Forensics laboratory analysis and decrease timelines, lower uncertainties, and increase confidence in technical nuclear forensics conclusions supporting attribution.			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / **Counter Weapons of Mass Destruction Applied Research*	**Project (Number/Name)** RF / *Forensics Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
- Investigate and develop novel concepts enabling radical reductions in the time required to conduct ground fallout debris collections, conduct analyses in the field, and obtain nuclear forensic results. ***FY 2019 Plans:*** - Reduce the fixed lab process timeline by 50%, increasing confidence and decreasing technical uncertainties in the materials forensics results. This will be accomplished through expanded interpretability of test results, improvement in quality of ground samples, including complex debris from transient environments, and optimization of current debris analysis constructs. - Evaluate and extract relevant data from historic nuclear tests to help calibrate codes to support device characterization improvements. - Expand signature databases with appropriate information on generic designs, known weapon designs, and known effects. - Increase capability development efforts in ubiquitous networks and airborne platforms to support prompt diagnostics and forensics technology improvements. - Conduct/lead a DoD and interagency end-to-end nuclear forensics process technology demonstration and evaluation of DTRA-developed technologies/methodologies to assess NTNF process improvements. - Identify potential development of a new advanced capability in forensic conclusion confidence, timeliness, and accuracy, and assist in assessing contribution to interagency attribution process and decisions. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change.			
Accomplishments/Planned Programs Subtotals	9.176	10.274	10.257

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 27/0603160BR: *Counter Weapons of Mass Destruction Advanced Technology Development*	36.738	40.286	33.578	-	33.578	32.973	33.668	34.371	35.094	Continuing	Continuing
• 122/0605000BR: *Counter Weapons of Mass Destruction Systems Development*	4.479	6.241	6.163	-	6.163	4.821	5.340	5.602	5.720	Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / **Counter Weapons of Mass Destruction Applied Research*	**Project (Number/Name)** RF / *Forensics Technologies*

D. Acquisition Strategy

Competitive selection of most appropriate performers to fulfill science and technology development needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.

E. Performance Metrics

Percentage of Counter WMD technologies selected for transition to advanced technology development (6.3) and advanced component development and prototypes (6.4).

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research	Project (Number/Name) RG / Defeat Technologies	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RG: *Defeat Technologies*	86.028	10.428	11.060	12.959	-	12.959	13.262	13.222	13.436	13.634	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Defeat Technologies project develops innovative kinetic and non-kinetic weapon technologies to expand traditional and asymmetric options available to Combatant Commanders to deny, disrupt, and defeat adversarial use of Weapons of Mass Destruction (WMD) while minimizing collateral effects. Technology development focuses on the physical or functional defeat of WMD threat materials, an adversary's ability to deliver the same, and the physical and nonphysical support networks enabling both. It does so through the systematic identification and maturation of technologies capable of defeating WMD agents or agent-based processes and selecting technologies for integration into weapons, delivery systems, or rapid WMD elimination capabilities. This effort includes developing specific WMD agent/agent-based process simulants, sub-scale test infrastructure, and sampling capability required for effective development, testing, and evaluation of next-generation Countering WMD (CWMD) capabilities. The project places a high priority on understanding, characterizing, and validating potential weapon effects within mathematical confidence as it relates to the unintended release of hazardous threat materials. Technologies with the potential for weapon and capability integration are transitioned to the advanced technology development effort under this project. On a limited basis, technology test data is shared with coalition partners.

DTRA's Counter - Improvised Explosive Device / Counter- small Unmanned Aerial Systems (C-IED/C-sUAS) mission includes three primary lines of effort - attack the supporting threat network, protecting US forces, and building partner capacity. Since DTRA already provides this support in helping the Department counter IEDs for the US joint force, it follows that DTRA is the most-appropriate Department asset to undertake this C-sUAS coordination mission - to provide counter threat network support to deployed forces, C-IED/C-sUAS technology solutions, C-IED/C-sUAS training support (deploying and deployed US joint forces), and building partner nation capacity all while coordinating the overall Department's (C-IED/C-sUAS) efforts.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: RG: Defeat Technologies	10.428	11.060	12.959
Description: Project RG develops innovative kinetic and non-kinetic weapon technologies to expand traditional and asymmetric options available to Combatant Commanders to deny, disrupt, and defeat adversarial use of WMD while minimizing collateral effects.			
FY 2018 Plans: - Continue static demonstrations of access denial and denial-of-use technologies against representative WMD threats. - Conduct scaled demonstrations of access denial and denial-of-use technologies against representative WMD threats. - Continue sub-scale tests of new standoff weapon payloads to defeat chemical and biological warfare targets. - Continue sub-scale tests of emergent technologies to accurately measure WMD simulant released in a plume.			
FY 2019 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / **Counter Weapons of Mass Destruction Applied Research*	**Project (Number/Name)** RG / *Defeat Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
- Conduct an incremental capability demonstration for an autonomous systems technology update to the Modular Autonomous Counter-WMD System B (MACS-B). - Develop future MACS advanced holistic payloads, refining the concept and conducting technology investigation. - Develop Combined Effects Payload for Access Denial (CEPAD) payload. - Collect signatures on threat-improvised rotary winged and fixed winged IED/sUAS in a lab and field environment. - Provide infrastructure to collect signatures including sensors, lab, and field equipment, collection software and collection tools. - Provide a consolidated C-IED/C-sUAS library including database(s), database access, and database/library management including entry, creation and vetting of information. Analyze C-IED/C-sUAS equipment data, and create/sustain algorithms, databases and tables to monitor the creation and vetting of information. - Monitor exploitation of rotary winged, fixed winged IED/C-sUAS to manage the capability gap (from a technology and database standpoint). ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase from FY 2018 to FY 2019 is due to the net effect of the realignment of funds to support experimental activities in Project RM in program element 0603160BR and increased investment to counter IED/C-sUAS.			
Accomplishments/Planned Programs Subtotals	10.428	11.060	12.959

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 27/0603160BR: *Counter Weapons of Mass Destruction Advanced Technology Development*	18.819	22.161	49.277	-	49.277	24.491	24.108	24.578	25.010	Continuing	Continuing

Remarks

D. Acquisition Strategy

Competitive selection of most appropriate performers to fulfill science and technology development needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.

E. Performance Metrics

Percentage of CWMD technologies selected for transition to advanced technology development (6.3) and advanced component development and prototypes (6.4).

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research	Project (Number/Name) RI / Nuclear Survivability	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RI: *Nuclear Survivability*	129.182	30.085	34.103	32.732	-	32.732	33.723	34.479	32.915	33.841	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Nuclear Survivability project develops innovative technologies for the protection of mission-essential personnel, critical military and national defense capabilities, and associated control and support systems during a nuclear event. Research under this project supports the mission critical systems identified under Department of Defense Instruction 3150.09, Chemical, Biological, Radiological, and Nuclear Survivability Policy. The Defense Threat Reduction Agency is designated by the Department of Defense (DoD) as the center of excellence for electromagnetic pulse (EMP) survivability assessments. The System Vulnerability and Assessment effort develops nuclear assessment capabilities to support operational planning, weapons effects predictions, and strategic system design. This activity also provides the DoD's nuclear design and protection standards for new and existing systems, e.g., command and control facilities and aircraft. Key systems include the Nuclear Command and Control System, the net-centric thin-line, and both military and civilian satellites and associated support systems. The radiation hardened nano-electronics effort develops and demonstrates radiation-hardened, high-performance prototype nano-electronics to meet DoD strategic deterrence system requirements. Experimental Capabilities activities provide the warfighter with unique x-ray, gamma ray, and EMP test capabilities in support of system survivability development, certification, and sustainment. This effort leverages research from and coordinates with the National Nuclear Security Administration (United States) and the Atomic Weapons Establishment (United Kingdom) to develop enabling technologies for improved nuclear weapon effects experimentation capabilities. Nuclear technology analysis efforts support detailed planning related to policy, strategy, objectives, and programmatic integration. These efforts also support international collaboration, user groups, case study reviews, and the Joint Atomic Information Exchange Group. The human survivability effort conducts research to develop and validate mortality and morbidity models associated with radiological and nuclear weapon effects.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: RI: Nuclear Survivability	30.085	34.103	32.732
Description: Project RI provides the capability for DoD nuclear forces and their associated control and support systems and facilities to avoid, repel, endure, or withstand attack or other hostile action, to the extent that essential functions can continue or be resumed after the onset of hostile action.			
FY 2018 Plans: - Develop nuclear countermeasure and neutron biological effectiveness modeling in DTRA's existing Health Effects from Radiological & Nuclear Environments (HENRE) R&D computer code and, upon validation and verification, update United States Strategic Command (USSTRATCOM) and DTRA operational codes; this modeling will assist DoD and other federal agencies in selecting and supporting specific nuclear countermeasures. - Complete development of and implement a methodology for comprehensive analysis of the DoD Chemical, Biological, Radiological, and Nuclear Mission-Critical Reports for nuclear survivability and hardening of Mission-Critical Systems/Equipment per DoDI 3150.09.			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / **Counter Weapons of Mass Destruction Applied Research*	**Project (Number/Name)** RI / *Nuclear Survivability*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
- Continue to evaluate High Altitude Electromagnetic Pulse (HEMP) threat survivability for Aegis Ashore-Poland and satellite communication ground facilities. - Continue to investigate electromagnetic pulse effects on power grid transformers, as part of a collaborative research effort with the United Kingdom on critical civilian and defense infrastructure. - Continue to provide nuclear scintillation expertise to DoD and Service Program Executive Offices (PEOs) to assist in certification of disturbed channel simulators and new survivable satellite communication systems. - Publish update to MIL-STD-188-125-1, HEMP Protection for Ground-Based Command, Control, Communications, Computers, and Intelligence (C4I) Facilities Performing Critical, Time-Urgent Missions: Part 1 Fixed Facilities and update to MIL-HDBK-423 HEMP Protection for Ground-based, Mission-Critical Facilities Part 1 Fixed Facilities, Part I. - Publish Nuclear Disturbed Communications Environment Annex to the Consolidated Afloat Networks and Enterprise Services Military Standard to assist DoD and Service PEOs. - Complete HEMP Certification recommendation to USSTRATCOM for the Missile Defense Complex, Ft. Greely, AK. - Apply advanced electron beam diagnostics to characterize the PITHON test capability at the DTRA West Coast Facility for strategic reentry systems survivability. - Continue to develop or initiate development of and demonstrate an advanced warm x-ray spectrometer to reduce uncertainties and design margins for code validation and electronics certification. - Demonstrate an advanced Single Wire Radiator array warm x-ray source on Double-EAGLE at the DTRA West Coast Facility for strategic reentry systems survivability. - Demonstrate multi-point x-ray sources at the National Ignition Facility to improve cold x-ray test capabilities for strategic and missile defense systems. - Demonstrate a large-area direct laser impulse test capability at the National Ignition Facility for strategic system survivability certification. - Complete study of satellite solar power array response phenomenologies in pulsed x-ray environments. - Support Missile Defense Agency cold x-ray survivability experiments at the National Ignition Facility. - Continue to develop the 16/14nm Radiation Hardened by Design (RHBD) Library. - Continue development of Complementary e-Beam Lithography (CeBL) technologies to reduce the cost of low volume DoD radiation hardened micro and nano-electronics. - Develop RHBD neutron Single Event Effects mitigation techniques for strategic radiation hardened digital complementary metal–oxide–semiconductor and Analog Mixed Signal Devices. - Complete development of the Satellite System Natural and Nuclear Environment Protection Standard. - Complete exploration of technology-agnostic radiation hardening for Boolean logic and multipliers using the principles of information theory and transition results to the 14nm RHBD program.			
FY 2019 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / **Counter Weapons of Mass Destruction Applied Research*	**Project (Number/Name)** RI / *Nuclear Survivability*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
- Align nuclear detonation personnel casualty output from DTRA's Health Effects from Radiological & Nuclear Environments (HENRE) for Hazard Prediction and Assessment Capability (HPAC) to the Defense Health Agency's Joint Medical Planning Tool. - Advance cold/warm x-ray and laser experimentation in order to improve nuclear survivability. For cold x-ray impulse, initiate ion beam and diagnostics development on PITHON, leading to high fluence x-rays for materials and full system impulse capability for Re-entry Vehicles/Re-entry Bodies to improve radiation survivability. Complete debris mitigation system for Double-EAGLE in support of cold x-rays for optics and thermostructural response efforts that support Missile Defense Agency (MDA) and satellite systems requirements - Translate radiation hardening basic mechanisms and physics of failure into engineering solutions to improve device and component hardening and survivability. - Update environment and protection standards on periodic five year intervals and respond to Service and Combatant Command requests for verification assessments, to include conduct of U.S. European Command/ U.S. Pacific Command Operational Plan and mission critical systems analytical assessments. - Continue development of RHBD neutron Single Event Effects mitigation techniques for strategic radiation hardened digital complementary metal-oxide-semiconductor and Analog Mixed Signal Devices. - Develop HEMP, atmospheric, and disturbed environment standards; conduct verification assessments for the Services and MDA; develop technology insertions; and provide subject-matter expert support to provide combat readiness and survivability status to leadership and feedback for Military Standards validity. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease from FY 2018 to FY 2019 is due to reduced investment in radiation hardened Nano-electronics.			
Accomplishments/Planned Programs Subtotals	30.085	34.103	32.732

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 27/0603160BR: *Counter Weapons of Mass Destruction Advanced Technology Development*	5.964	6.658	5.783	-	5.783	5.946	6.025	6.156	6.285	Continuing	Continuing

Remarks

D. Acquisition Strategy

Competitive selection of most appropriate performers to fulfill science and technology development needs. Performer base includes best-of-breed researchers across the DoD and other government agency laboratories, academia, industry, and international partner organizations.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / **Counter Weapons of Mass Destruction Applied Research*	**Project (Number/Name)** RI / *Nuclear Survivability*

E. Performance Metrics

Percentage of CWMD technologies selected for transition to advanced technology development (6.3) and advanced component development and prototypes (6.4).

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research	Project (Number/Name) RL / Nuclear & Radiological Effects	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RL: *Nuclear & Radiological Effects*	158.822	26.419	29.228	29.388	-	29.388	30.054	30.723	31.413	32.072	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Nuclear and Radiological Effects project develops modeling tools to: support military operational planning, weapons effects predictions, and strategic system design decisions; consolidate validated modeling tools into the Joint Information Environment for integrated functionality; predict system responses to nuclear and radiological weapons producing electromagnetic, thermal, blast, shock, and radiation environments; provide detailed adversary nuclear infrastructure characterization to enhance counterforce operations and hazard effects; and, develop foreign nuclear weapon outputs.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: RL: Nuclear & Radiological Effects	26.419	29.228	29.388
Description: Project RL develops nuclear and radiological assessment modeling tools to support military operational planning, weapons effects predictions, and strategic system design decisions. ***FY 2018 Plans:*** - Continue to develop nuclear weapons effects tools and analyses for effective targeting, including methods to evaluate the consequences of execution of a given course of action. - Continue to develop enhanced High Altitude Radiation Phenomenology functionality for use on modern computer systems. - Continue to develop initial weapon output spectrum extension required by missile defense systems to ensure critical systems can accomplish their designated missions when exposed to a nuclear weapons environment. - Continue to develop combined effects methodologies to ensure critical systems can accomplish their designated missions when exposed to a nuclear weapons environment. - Continue to develop an authoritative source of foreign and historical nuclear weapon outputs to aid in the development of uniform nuclear survivability standards, hardening technologies, and experimental test capabilities. ***FY 2019 Plans:*** - Develop system-generated electromagnetic pulse follow-on efforts and electromagnetic pulse coupling and response efforts to deliver high-fidelity early-time electromagnetic analysis and operational tools for US and Allied nuclear weapon effects stakeholders. - Publish updates to Weapons Output eBooks, delivering high-fidelity nuclear source terms and historical test data for use in, and validation of, modern weapon effects codes.			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / **Counter Weapons of Mass Destruction Applied Research*	**Project (Number/Name)** RL / *Nuclear & Radiological Effects*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
- Develop petroleum effects models for Consequences of Execution, linking higher order impacts to Political Military Economic Social Infrastructure Information (PMESII) analyses. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change.			
Accomplishments/Planned Programs Subtotals	26.419	29.228	29.388

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 27/0603000BR: *Counter Weapons of Mass Destruction Advanced Technology Development*	3.390	3.500	3.427	-	3.427	3.426	3.424	3.424	3.497	Continuing	Continuing

Remarks

*Prior year funds related to this this project in program element number 0605000BR.

D. Acquisition Strategy

Competitive selection of most appropriate performers to fulfill science and technology development needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.

E. Performance Metrics

Percentage of Counter WMD technologies selected for transition to advanced technology development (6.3) and advanced component development and prototypes (6.4).

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research	Project (Number/Name) RM / *WMD Counterforce Technologies*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RM: *WMD Counterforce Technologies*	92.653	11.702	14.552	12.780	-	12.780	12.991	13.736	13.483	14.081	Continuing	Continuing

A. Mission Description and Budget Item Justification

The WMD Counterforce Technologies Project develops Countering Weapons of Mass Destruction (CWMD) weapon effects modeling algorithms, full and sub-scale test series required to investigate CWMD weapon effects and sensor performance, and visualization and situational awareness tools to support the next generation Defense Threat Reduction Agency (DTRA) Technical Reachback cell. These activities are critical enablers for the development of advanced CWMD planning tools and include Advanced Energetics and Advanced Life Sciences. Advanced Energetics develops energetic materials and weapon design technology providing advanced defeat capabilities for engaging hard and deeply buried targets that are well beyond current high explosive blast/fragmentation warhead technology. Advanced Life Sciences research develops technologies to find, locate, mitigate, and defeat WMD using bio-organisms or components.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: RM: WMD Counterforce Technologies	11.702	14.552	12.780
Description: Project RM provides novel and enhanced weapons energetic materials and structures, full-scale testing of counter WMD weapon effects, weapon effects modeling, weapon delivery optimization, and technical reachback services.			
FY 2018 Plans: - Continue to demonstrate upgraded small scale Hybrid Enhanced Blast Explosives for improved agent defeat capability. - Deliver agent defeat weapon effects models to include post blast agent release and dispersion from multiple agent release mechanisms, agent mass transport, break-up and phase change, and agent fate for modeling and simulation (M&S) planning tool enhancements. - Complete tests to deliver data for updating chemical agent source term models within the Integrated Munitions Effects Assessment (IMEA) and for calibration and validation of Second-order Closure Integrated Puff (SCIPUFF). - Complete calculations and mid / large-scale tests, and deliver weapons effects models to include blast and debris environment from embedded detonation, blast dynamic pressure, fragmentation, and blast through blast doors.			
FY 2019 Plans: - Transition Hellfire-sized structural reactive material warhead technology and design to the Military services to improve capabilities to hold targets at risk. - Advance technical capabilities or methods to detect, locate/track, identify, characterize, monitor, assess, plan and protect against, deter, delay, disrupt, neutralize, or destroy WMD through special innovative research targeted at meeting capability gaps in CWMD.			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / **Counter Weapons of Mass Destruction Applied Research*	**Project (Number/Name)** RM / *WMD Counterforce Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
- Test biocide at larger scale to analyze prompt and persistent effects, improving capability to neutralize or destroy biological weapons or agents. - Develop CWMD weapon effects modeling algorithms and scaled test series leveraging machine learning and optimization for attack planning to investigate CWMD weapon effects, and enhance WMD defeat Modeling and Simulation planning tools. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease from FY 2018 to FY 2019 is due to the realignment of the High Performance Computing (HPC) activity from Project RM to Project RA.			
Accomplishments/Planned Programs Subtotals	11.702	14.552	12.780

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 27/0603160BR: *Counter Weapons of Mass Destruction Advanced Technology Development*	23.041	24.663	25.243	-	25.243	25.905	26.911	27.520	28.097	Continuing	Continuing

Remarks

D. Acquisition Strategy

Competitive selection of most appropriate performers to fulfill science and technology development needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.

E. Performance Metrics

Percentage of CWMD technologies selected for transition to advanced technology development (6.3) and advanced component development and prototypes (6.4).

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research	Project (Number/Name) RR / *Countering WMD Test and Evaluation*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RR: *Countering WMD Test and Evaluation*	73.113	13.501	13.652	14.345	-	14.345	14.816	15.156	15.451	15.775	Continuing	Continuing

Note

**Project RR title changed from Combating WMD Test and Evaluation to Countering WMD Test and Evaluation beginning in FY 2017.

A. Mission Description and Budget Item Justification

The Countering WMD Test and Evaluation project provides a unique national test capability for simulated Weapons of Mass Destruction (WMD) facilities and processes. This capability provides structured and systematic end-to-end test event planning, preparation, management, execution, and data analysis. It also offers test instrumentation (data acquisition systems and optics), scientific analysis and predictions, test article construction, test article/test bed remediation, tunnel mining, architectural and engineering design, systems engineering and integration, and test data management. The facility leverages 50 years of expertise in investigating weapons effects and target response across the spectrum of hostile environments that could be created by proliferent nations or terrorist organizations with access to advanced conventional weapons or WMD. Subject matter experts design full and sub-scale testing strategies focusing on weapon-target interaction with fixed soft and hardened facilities to include above ground facilities, cut-and-cover facilities, and deep underground tunnels. This capability does not exist anywhere else within the Department of Defense (DoD) and supports the counterproliferation pillar of the National Strategy to Counter WMD.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: RR: Countering WMD Test and Evaluation	13.501	13.652	14.345
Description: Project RR provides a unique national test bed capability for the study of weapon-target interaction, simulated WMD facility characterization, and WMD facility defeat testing to evaluate the implications of WMD and other special weapon use against U.S. military and civilian assets.			
FY 2018 Plans: - Continue to support Combatant Commands with development and testing of Chemical, Biological, Radiological, Nuclear, and High-Explosive (CBRNE) sensors, WMD countermeasures, remote geological sensing, and battle management systems designed for surveillance and tracking of WMD targets. - Support Combatant Command exercises and planning events in order to develop existing Counter WMD (CWMD) technologies, tools, and capabilities. - Continue pursuit of state-of-the-art chemical and biological testing capabilities with participation in the Integrated Early Warning program, the inter-agency Layered Sensing Initiative, the Integrated Sensor Architecture, and the Army Technical Support and Operational Analysis (TSOA) in order to satisfy emerging warfighting gaps. - Extend testing in support of the nonproliferation portion of the National Center for Nuclear Security portfolio.			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / **Counter Weapons of Mass Destruction Applied Research*	**Project (Number/Name)** RR / *Countering WMD Test and Evaluation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
- Continue to develop nuclear material detection capabilities through testing of candidate technologies at the Technical Evaluation Assessment and Monitoring Site. - Continue to test and demonstrate credible and threat-based WMD attack scenarios at the Nevada National Security Site for Defense Threat Reduction Agency (DTRA) and partner agency projects supporting development of warfighter-identified missile defeat capability requirements. - Continue to conduct diagnostics, instrumentation, and explosives handling research in support of Department of Energy and National Laboratories Source Physics Experiments, supporting Treaty Verification Technology and Comprehensive Test Ban Treaty initiatives. - Initiate reconstitution of instrumentation and diagnostics sensors infrastructure capabilities in support of Counter-WMD technology development projects. - Continue planning the design and execution of tests characterizing a chemical/biological plume generated by an explosive event in support of the DTRA Agent Defeat Modeling and Simulation Baseline (ADMB) initiative. - Continue to design and build testbeds in small-, mid-, and large-scale environments capable of capturing data needed to improve and validate high-fidelity modeling and simulation tools used to predict weapons effects on WMD storage facilities. - Initiate decoupling test program using conventional explosives to develop modern seismic-acoustic data sets at varying levels of coupling, for the purpose of deriving signatures that are similar to recent nuclear test detonations for treaty verification purposes. - Reconstitute the Photogrammetry Laboratory equipment inventory (static and dynamic) for pre- and post-test characterization of geology deriving seismic-acoustic signatures, and providing imagery for warfighter planning and targeting analyses.			
FY 2019 Plans: - Develop the use of seismo-acoustic arrays as test diagnostics (both hardware and algorithms) and tools for assessing decoupling/coupling. - Continue reconstitution of instrumentation and diagnostics sensors infrastructure capabilities in support of Counter-WMD technology development projects. - Continue additional diagnostics, instrumentation, and explosives handling research in support of other testing and compliance initiatives. - Support Combatant Commands with development and testing of CBRNE sensors and WMD countermeasures being developed to support Combatant Command requirements. - Support exercises and planning events at the Nevada Test Bed in order to develop existing defeat technologies, tools, and capabilities. Further extend testing at the Nevada National Security Site in support of the National Center for Nuclear Security portfolio's nonproliferation efforts. - Continue to design and build testbeds in small-, mid-, and large-scale environments capable of capturing data needed to improve and validate high-fidelity modeling and simulation tools used to predict weapons effects on WMD storage facilities.			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / **Counter Weapons of Mass Destruction Applied Research*	**Project (Number/Name)** RR / *Countering WMD Test and Evaluation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
- Provide development, maintenance, upgrades, and testing for Autonomous Systems Test Development to support an adaptable test bed for standardized evaluation of autonomous systems in development for CWMD missions. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase from FY2018 to FY2019 is due to greater investment in test infrastructure in support of the maintenance and development of WMD countermeasure testing capabilities.			
Accomplishments/Planned Programs Subtotals	13.501	13.652	14.345

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 27/0603160BR: *Counter Weapons of Mass Destruction Advanced Technology Development*	0.000	12.500	12.394	-	12.394	12.389	12.389	12.389	12.649	Continuing	Continuing

Remarks

D. Acquisition Strategy

Competitive selection of most appropriate performers to fulfill science and technology development needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.

E. Performance Metrics

Percentage of CWMD technologies selected for transition to advanced technology development (6.3) and advanced component development and prototypes (6.4).

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Defense Threat Reduction Agency	Date: February 2018
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603134BR / *Counter Improvised-Threat Simulation*

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	0.000	13.648	13.648	0.000	0.000	0.000	0.000	Continuing	Continuing
JC: *Enable Rapid Capability Delivery*	-	0.000	0.000	0.000	13.648	13.648	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

PE 0603134BR / Counter Improvised-Threat Simulation activities were previously authorized and appropriated under the Joint Improvised-Threat Defeat Fund (JIDF).

A. Mission Description and Budget Item Justification

The Defense Threat Reduction Agency (DTRA) Counter Improvised-Threat Simulation Advanced Technology Development program element funds Technology Outreach as well as development of modeling-and-simulation and analysis support tools that enhance counter-improvised explosive devices (C-IED) and counter improvised threat (C-IT) efforts.

Enable Rapid Capability Delivery. Understanding the threat drives a DTRA-JIDO deliberate, structured, and proactive approach to identify and validate urgent or emergent capability gaps and requirements. JIDO's continuous embedded presence with deployed U.S. Joint Forces enables early identification and understanding of C-IED and C-IT gaps, vulnerabilities, and risks and the timely validation, resourcing, development, and delivery of C-IED and C-IT material and non-material solutions. DTRA-JIDO technical integrators embedded with deployed forces further enables rapid adjustments to solutions as the threat's adaptation evolves.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	0.000	13.648	13.648
Total Adjustments	0.000	0.000	0.000	13.648	13.648
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Establish RDT&E Appropriation	-	-	0.000	13.648	13.648

Change Summary Explanation

The increase from FY 2018 to FY 2019 is due to the establishment of the 0603134BR / Counter Improvised-Threat Simulation program element in RDT&E appropriation. This reflects the realignment of the DTRA-JIDO research and development activities in accordance with Congressional intent to terminate the

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Defense Threat Reduction Agency	Date: February 2018
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603134BR *I Counter Improvised-Threat Simulation*

Joint Improvised-Threat Defeat Fund in section 9015 of the Chairman's recommendation to the Senate Appropriations Committee for the Department of Defense Appropriations Bill, 2018 (FY 2018 Baseline: $0 million.)

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603134BR / *Counter Improvised-Threat Simulation*	Project (Number/Name) JC / *Enable Rapid Capability Delivery*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
JC: *Enable Rapid Capability Delivery*	-	0.000	0.000	0.000	13.648	13.648	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

Enable Rapid Capability Delivery. Understanding the threat drives a DTRA-JIDO deliberate, structured, and proactive approach to identify and validate urgent or emergent capability gaps and requirements. JIDO's continuous embedded presence with deployed U.S. Joint Forces enables early identification and understanding of C-IED and C-IT gaps, vulnerabilities, and risks and the timely validation, resourcing, development, and delivery of C-IED and C-IT material and non-material solutions. DTRA-JIDO technical integrators embedded with deployed forces further enables rapid adjustments to solutions as the threat's adaptation evolves.

DTRA provides DoD up to an 18-month "head start" on addressing critical warfighter gaps, and enables DoD to deliver the most technologically advanced response to improvised threats. These capabilities are developed from previous JIDO experience and in concert with OGAs, National Labs, Academia, Private Industry, and International Partners.

This project employs Technology Outreach as well as development of modeling-and-simulation and analysis support tools to identify and validate urgent and emergent capability requirements and associated gaps. It provides rapid acquisition and delivery of C-IED and C-IT solutions to address these requirements and gaps.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: JC: Enable Rapid Capability Delivery	0.000	0.000	0.000	13.648	13.648
FY 2018 Plans: N/A					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: - Improve detection capabilities through baseline threat signatures for vehicles, explosives, and other threats in support of sensor capability development. - Develop common database for signatures for DoD and OGA to use for sensor development and Tactics, Techniques, and Procedures (TTPs). - Identify and maintain database of future threats and technologies that can be incorporated into improvised threats in support of future capability development.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603134BR / *Counter Improvised-Threat Simulation*	**Project (Number/Name)** JC / *Enable Rapid Capability Delivery*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Conduct testing and evaluation of future technology development in support of counter improvised threats. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase from FY 2018 to FY 2019 is due to the establishment of JC: Enable Rapid Capability Delivery project in 0603134BR / Counter Improvised-Threat Simulation in the RDT&E appropriation. This reflects the realignment of the DTRA-JIDO research and development activities in accordance with Congressional intent to terminate the Joint Improvised-Threat Defeat Fund in section 9015 of the Chairman's recommendation to the Senate Appropriations Committee for the Department of Defense Appropriations Bill, 2018 (FY 2018 Baseline: $0 million.)					
Accomplishments/Planned Programs Subtotals	0.000	0.000	0.000	13.648	13.648

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Defense Threat Reduction Agency											Date: February 2018	
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*					R-1 Program Element (Number/Name) PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	1,697.109	260.396	268.607	299.858	-	299.858	278.093	283.781	289.325	295.317	Continuing	Continuing
RA: *Information Sciences and Applications*	33.026	18.102	10.229	11.286	-	11.286	11.480	11.752	12.005	12.258	Continuing	Continuing
RD: *Detection Technologies*	26.415	16.608	17.556	26.021	-	26.021	27.110	28.170	28.867	29.472	Continuing	Continuing
RE: *Counter-Terrorism Technologies*	658.580	98.532	103.869	108.978	-	108.978	111.060	113.426	115.596	118.024	Continuing	Continuing
RF: *Forensics Technologies*	397.190	36.738	40.286	33.578	-	33.578	32.973	33.668	34.371	35.094	Continuing	Continuing
RG: *Defeat Technologies*	116.069	18.819	22.161	49.277	-	49.277	24.491	24.108	24.578	25.010	Continuing	Continuing
RI: *Nuclear Survivability*	44.529	5.964	6.658	5.783	-	5.783	5.946	6.025	6.156	6.285	Continuing	Continuing
RL: *Nuclear & Radiological Effects*	0.000	3.390	3.500	3.427	-	3.427	3.426	3.424	3.424	3.497	Continuing	Continuing
RM: *WMD Counterforce Technologies*	150.509	23.041	24.663	25.243	-	25.243	25.905	26.911	27.520	28.097	Continuing	Continuing
RR: *Countering WMD Test and Evaluation*	16.052	0.000	12.500	12.394	-	12.394	12.389	12.389	12.389	12.649	Continuing	Continuing
RT: *Target Assessment Technologies*	254.739	39.202	27.185	23.871	-	23.871	23.313	23.908	24.419	24.931	Continuing	Continuing

Note

*Program Element 0603160BR name changes from Counterproliferation Initiatives - Proliferation, Prevention and Defeat to Counter Weapons of Mass Destruction Advanced Technology Development beginning in FY 2018.

**Project RR title changes from Combating WMD Test and Evaluation to Countering WMD Test and Evaluation beginning in FY 2017. The funding level in this program element continues to reflect the impact of incremental Service Requirement Review Board reductions, as part of the Department of Defense reform agenda, for consolidation and reduction of service contracts.

A. Mission Description and Budget Item Justification

The Defense Threat Reduction Agency (DTRA) Counter Weapons of Mass Destruction (WMD) Advanced Technology Development program element funds the development and testing of subsystems and components for integration into prototype systems with the potential to transition into mature, state-of-the-art WMD surveillance, detection, defeat, prevention, nonproliferation, counterproliferation, consequence management, and treaty verification capabilities.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Defense Threat Reduction Agency	Date: February 2018
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*

The Advanced Technology Development portfolio is aligned with strategic planning objectives as well as with Science and Technology (S&T) investment direction which is established annually by DTRA. The objectives directly support policy and planning guidance from the Office of the President, the Department of Defense (DoD), and the broader WMD threat reduction community.

The portfolio advances the Countering WMD (CWMD) mission by selecting advanced technology development initiatives that meet the following criteria: (1) Efforts are clearly defined and directly linked to mission-specific capability requirements of DTRA, the Military Departments, Combatant Commanders, other DoD and federal agencies, and international partners; (2) preliminary assessments of subsystems and components offer the highest potential for technological feasibility, operability and producibility upon transition out of S&T research; (3) activities demonstrate cost effectiveness or cost reduction potential of technologies during field testing or simulation at scale.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	266.444	268.607	273.973	-	273.973
Current President's Budget	260.396	268.607	299.858	-	299.858
Total Adjustments	-6.048	0.000	25.885	-	25.885
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-6.048	-			
• Realignments	-	-	-0.821	-	-0.821
• Programmatic Increase	-	-	29.000	-	29.000
• Economic Assumptions	-	-	-2.294	-	-2.294

Change Summary Explanation

The increase in FY 2019 from the previous President's Budget submission is due to the net effect of increased investment to monitor the threat's use and facilitation of IED/sUAS including rotary winged, fixed winged, and improvised, a transfer of funding from this program element to DTRA's Operations and Maintenance appropriation in support of stockpile logistics, a transfer of funding from Program Element 0602718BR for CWMD terrorism support, and lower economic assumptions for inflation.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*	**Project (Number/Name)** RA / *Information Sciences and Applications*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RA: *Information Sciences and Applications*	33.026	18.102	10.229	11.286	-	11.286	11.480	11.752	12.005	12.258	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Information Sciences and Applications project provides technical expertise and reach-back support to the United States and its allies across the Countering Weapons of Mass Destruction (CWMD) mission space. The project performs continuous modeling of ad hoc computational analyses on the consequences of Weapons of Mass Destruction (WMD) in consultation with military and civilian planners, warfighters, and first responders, and leverages research performed by the Project on Advanced Systems and Concepts for CWMD at the Naval Postgraduate School. The project also supports international CWMD cooperation by developing technologies and concepts suitable for foreign release.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: RA: Information Sciences and Applications	18.102	10.229	11.286
Description: Project RA develops modeling and simulation capabilities and provides technical reachback support to maintain and increase decision advantage for the United States and its allies through improved situational understanding across the complete CWMD mission space. ***FY 2018 Plans:*** - Continue to develop the global synthetic population and activity database for modeling infectious disease propagation and impacts of population behaviors and movement after a WMD event in support of Combatant Command force health protection and consequence management planning. - Continue to develop detailed models of specified nuclear facilities to analyze vulnerabilities and estimate hazards in support of target and consequence management planning. - Continue to develop processes, capabilities, and expertise in Chemical, Biological, Radiological, Nuclear, and High-yield Explosives (CBRNE) in order to provide tailored support to the Department of Defense (DoD) with 24/7 Technical Reachback. ***FY 2019 Plans:*** - Continue to provide tailored support to DoD with 24/7 Technical Reachback via processes, capabilities, and expertise in CBRNE. Leverage this support for partner stakeholders, providing scientific modeling support to Department of Health and Human Services and serving as the Federal Emergency Management Agency's Interagency Modeling and Atmospheric Assessment Center (IMAAC) Technical Operations Hub.			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*	**Project (Number/Name)** RA / *Information Sciences and Applications*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
- Research and develop capabilities to predict/simulate Higher Order Effects, including spread of infectious disease and protection from WMD, and other required capabilities to support U.S. Strategic Command (USSTRATCOM). ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase from FY 2018 to FY 2019 is due to greater investment in technical reachback support capacity. This increase is driven by an anticipated further increase in requests for reachback support.			
Accomplishments/Planned Programs Subtotals	18.102	10.229	11.286

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 20/0602718BR: *Counter Weapons of Mass Destruction Applied Research*	35.048	30.270	31.830	-	31.830	29.977	30.167	30.412	31.270	Continuing	Continuing
• 153/0605502BR: *Small Business Innovation Research*	10.456	-	-	-	-	-	-	-	-	Continuing	Continuing

Remarks

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year. (This is Priority Goal 4.1.2, as cited in U.S. Department of Defense Agency Strategic Plan for Fiscal Years 2015-2018, in support of Strategic Objective 4.1, "Preserve investments to maintain our decisive technological superiority.")

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / *Counter Weapons of Mass Destruction Advanced Technology Development*	Project (Number/Name) RD / *Detection Technologies*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RD: *Detection Technologies*	26.415	16.608	17.556	26.021	-	26.021	27.110	28.170	28.867	29.472	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Detection Technologies project continues research formerly conducted under project RF. This project develops, integrates, and transitions advanced concepts, technologies, and subsystems enabling enhanced nuclear and radiological location, identification, and tracking capabilities. Leveraging gains made in applied research efforts, this project produces advancements in range, process time, sensitivity, and accuracy. In addition, this project continues the development of novel concepts and technologies enabling the identification and exploitation of non-radiation based signatures associated with nuclear threats (e.g., transportation of nuclear materials, patterns of activity, or unique materials).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: RD: Detection Technologies	16.608	17.556	26.021
Description: Project RD develops, integrates and transitions radiation detection technologies, as well as systems, tools, techniques, and procedures that take advantage of non-radiation based signatures, in order to advance warfighter capabilities to rapidly detect, localize, characterize, and interdict nuclear and radiological threats.			
FY 2018 Plans: - Transition sensor capabilities to replace Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) and Stryker obsolete radiological/nuclear equipment. - Continue to develop, test, and evaluate a handheld radiation monitor replacement that provides radioisotope identification capability and real-time information feed. - Continue to develop and deploy devices to enable low-cost operational testing and evaluation of radiation and nuclear threat signature detectors against simulated special nuclear material sources of interest, high-fidelity radiation test objects, and realistic threat mockups. - Continue to integrate interoperable systems enabling a true common operating picture among nuclear and radiological search teams, across platforms, and within shared or distributed areas. - Continue to test and evaluate new radiation and nuclear threat detection technologies in an operationally relevant environment to validate capabilities, improve prototypes, and provide required performance data. - Complete testing and evaluation of an operational high resolution gamma-ray imager suited for multiple mission sets to support integration with next generation nuclear imaging systems. - Design, fabricate, test, and characterize prototype passive roadside detection systems to determine the location and signature of nuclear material.			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*	**Project (Number/Name)** RD / *Detection Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
- Transition near-term technologies, such as helium-3 alternatives and automated particle identification, to generate prototypes and design packages that will meet operational needs. - Conduct advanced, operational testing and evaluation of radiation and nuclear threat detection systems to assess their performance. - Integrate back-end unit capabilities such as internal electronics and communications capabilities, nuclear and radiological signature collections, and non-radiation nuclear threat signature collections into new sensor systems. - Continue to integrate radiation and nuclear threat analysis algorithms into existing systems to evaluate accuracy and effectiveness in reducing process time and form factors. - Continue to demonstrate, test, and transition systems that remotely monitor nuclear and radiological threat signatures in local and wide area searches.			
FY 2019 Plans: - Test the Modular Airborne Gaseous Isotope Collection System (MAGICS) gas collection system in the field in support of closer, sooner, site-specific monitoring. Novel technologies are necessary to conduct gas monitoring in support of nuclear detection missions, as timing, signature strength and complex analysis present challenges. - Develop unattended sensor networks for autonomous detection and analysis. - Catalog relevant seismic signatures, and develop algorithms for signature detection. - Continue to conduct targeted research on component-level technologies, such as low-power electronics, solid-state photodetectors, search and ID algorithms, and helium-3 replacement technologies, which will improve existing detection technology subsystem components. - Develop and integrate nuclear and radiological signature collections into new sensor systems. - Further the development of nuclear threat analysis algorithms to be implemented in existing systems in order to increase accuracy and reduce processing time. - Demonstrate, test, and transition systems that remotely monitor nuclear and radiological threat signatures in small and wide areas. - Improve the setup, maintenance, and peer-to-peer collaboration provided by systems shared among nuclear and radiological search teams. - Test and evaluate new radiation detection technologies in order to validate capabilities, improve prototypes, and provide required performance data to support follow-on development. - Improve capabilities to effectively monitor and control networked systems of sensors, and expand the use of augmented reality to increase situational awareness. - Improve low-visibility, high-precision gamma spectroscopy, particularly for indoor or concealed operation. - Develop and integrate nuclear and radiological signature collections into new sensor systems.			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*	**Project (Number/Name)** RD / *Detection Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
- Further the development of nuclear threat analysis algorithms to be implemented in existing systems in order to increase accuracy and reduce processing time. - Demonstrate, test, and transition systems that remotely monitor nuclear and radiological threat signatures in small and wide areas. - Improve the setup, maintenance, and peer-to-peer collaboration provided by systems shared among nuclear and radiological search teams. - Test and evaluate new radiation detection technologies in order to validate capabilities, improve prototypes, and provide required performance data to support follow-on development. - Develop new capabilities to emplace detectors into previously denied areas. - Improve capabilities to effectively monitor and control networked systems of sensors, and expand the use of augmented reality to increase situational awareness. - Improve low-visibility, high-precision gamma spectroscopy, particularly for indoor or concealed operation. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase from FY 2018 to FY 2019 is due to the transition of monitoring and verification technology efforts from Project RF to Project RD.			
Accomplishments/Planned Programs Subtotals	16.608	17.556	26.021

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 20/0602718BR: *Counter Weapons of Mass Destruction Applied Research*	14.570	14.769	16.860	-	16.860	18.287	17.520	17.875	18.249	Continuing	Continuing

Remarks

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year. (This is Priority Goal 4.1.2, as cited in U.S. Department of Defense Agency Strategic Plan for Fiscal Years 2015-2018, in support of Strategic Objective 4.1, "Preserve investments to maintain our decisive technological superiority.")

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / *Counter Weapons of Mass Destruction Advanced Technology Development*	Project (Number/Name) RE / *Counter-Terrorism Technologies*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RE: *Counter-Terrorism Technologies*	658.580	98.532	103.869	108.978	-	108.978	111.060	113.426	115.596	118.024	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Counter-Terrorism Technologies project develops and transitions a full spectrum of new technologies to counter emergent weapons of mass destruction (WMD) threats. This project supports the U.S. Special Operations Command (USSOCOM) in two research areas: (1) Countering WMD-Terrorism (CWMD-T) Counterproliferation Research and Development is a collaborative effort to develop advanced, warfighter-unique technologies to defeat terrorist WMD development/ acquisition pathways, to include defeat of the devices themselves, while minimizing risks to U.S. forces; (2) USSOCOM CWMD-T Support develops concepts and technologies to integrate and synchronize operations and activities that prevent terrorists and rogue nation states from developing, acquiring, proliferating, or using WMD. This effort supports Commander, USSOCOM responsibilities under the Chairman, Joint Chiefs of Staff Unified Command Plan.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: RE: Counter-Terrorism Technologies	98.532	103.869	108.978
Description: Project RE supports Joint U.S. Military Forces, specifically USSOCOM, in the research areas of warfighter-unique, mission-specific WMD defeat, denial, counterproliferation, and interdiction technologies. ***FY 2018 Plans:*** - Continue to develop offensive counter proliferation, and counter-WMD technologies. - Continue to develop threat specific test articles and analyses for Tiered Threat Modeling Archive. - Continue to develop technologies that defeat unintended radio emissions. - Continue to develop lighter, smaller, more effective breaching capabilities. - Continue to develop next generation flexible x-ray technology applications. - Continue to develop WMD facility breaching technology applications. - Continue to develop Nuclear, Biological, and Chemical (NBC) defense technologies. - Continue to develop WMD render safe technologies. - Continue to develop technologies to maneuver in a WMD environment. - Continue to develop WMD pathway (process and facility) defeat technologies. - Perform prototype testing of machine learning tools for integration with the USSOCOM CWMD Support Program's (SCSP) Next Generation Joint Worldwide Intelligence Communications System (JWICS) Portal. - Integrate High Performance Computing (HPC) into the JWICS operating environment to provide more robust data analytics and improve accuracy of emerging WMD threat forecasts.			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*	**Project (Number/Name)** RE / *Counter-Terrorism Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
- Develop and test technologies for evaluating large quantities of data and intelligence information to improve smart discovery, data inferencing, and system-generated cueing and alerting capabilities. - Develop Graphic Analytics and Knowledge-Base Reasoning HPC applications. - Initiate development of models to enhance Discover and Search components of the Anticipatory WMD Analyst Reasoning Environment (AWARE) tool. - Continue to develop Dynamic Picture of the Operating Environment (DPOE) Knowledge Graphic and Predictive Analytics for Unknown Unknowns. - Develop Course of Action models for anticipatory adversarial actions. ***FY 2019 Plans:*** - Continue to develop offensive counterproliferation, counter-WMD technologies in support of combatant command requirements. - Continue development of WMD and pathway defeat technologies, as well as threat-specific test articles and analyses necessary to support the modeling archive used to support such developmental efforts. - Continue to develop lighter, smaller, more effective breaching capabilities. - Continue to develop next generation WMD detection technology applications. - Deploy AWARE V1.0 in DPOE 4.0, the next generation of DPOE that will incorporate research advances in HPC, analytics, and natural language processing. AWARE v1.0 will improve users' ability to identify emerging threat entities with existing personnel resources and reduce missed opportunities. - Integrate HPC software tools into DPOE, leveraging capabilities of high performance computing to improve automated analytics to more accurately or quickly identify events, actors and threats. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase from FY 2018 to FY 2019 is due to increased investment in an emerging program of record requirement to support and enable greater effectiveness of counter-WMD capabilities.			
Accomplishments/Planned Programs Subtotals	98.532	103.869	108.978

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 20/0602718BR: *Counter Weapons of Mass Destruction Applied Research*	0.099	-	-	-	-	-	-	-	-	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*	**Project (Number/Name)** RE / *Counter-Terrorism Technologies*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost

Remarks

Prior year funds are related to this project in program element 0602718BR.

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year. (This is Priority Goal 4.1.2, as cited in U.S. Department of Defense Agency Strategic Plan for Fiscal Years 2015-2018, in support of Strategic Objective 4.1, "Preserve investments to maintain our decisive technological superiority.")

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / *Counter Weapons of Mass Destruction Advanced Technology Development	Project (Number/Name) RF / Forensics Technologies	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RF: *Forensics Technologies*	397.190	36.738	40.286	33.578	-	33.578	32.973	33.668	34.371	35.094	Continuing	Continuing

Note

*Project RF-Detection and Forensics Technologies subdivides into Projects RD-Detection Technologies and RF-Forensics Technologies in FY 2016.

A. Mission Description and Budget Item Justification

The Forensics Technologies project develops, integrates, tests, and demonstrates post-detonation nuclear forensics systems providing accurate, rapid, and reliable means to collect, analyze, and evaluate prompt data and debris from a nuclear or radiological event in support of exploitation and attribution efforts. These forensic capabilities enable the Defense Threat Reduction Agency (DTRA) and its trusted partners to detect, locate, identify, track, and interdict nuclear and radiological threats, including weapons and material, and enablers to their acquisition and development. In accordance with DoD Directive S-2060.04, DTRA serves as the U.S. Government lead for post-detonation National Technical Nuclear Forensics (NTNF) research and development (R&D). As the central NTNF R&D coordinator, DTRA works in consultation with interagency partners to develop and improve ground-based capabilities supporting exploitation and attribution missions. NTNF R&D supports advanced research in the following areas: (1) Prompt nuclear effects exploitation for attribution; (2) nuclear device characterization for forensics; (3) nuclear forensic materials exploitation for attribution.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: RF: Forensics Technologies	36.738	40.286	33.578
Description: Project RF supports nuclear forensics by developing: (1) technologies, systems and procedures for post detonation nuclear forensics; (2) on/off-site analysis to meet forensic, verification, monitoring and confidence-building requirements; (3) technologies to detect, locate, identify, track, and interdict nuclear and radiological threats, including enablers to their acquisition and development.			
FY 2018 Plans: - Continue to develop, test, and demonstrate enhanced prototype technologies for prompt diagnostics, debris collection, analysis and diagnostics, and device and modeling to support nuclear device reconstruction and attribution, as well as to decrease timeline, lower uncertainty, and increase confidence in technical nuclear forensics conclusions supporting attribution. - Complete preparations and conduct an interagency technology demonstration and evaluation of end-to-end post-detonation nuclear forensics capabilities. - Evaluate surrogate debris materials as part of a demonstration and evaluation of field/fixed laboratory analysis and debris diagnostics processes. - Develop, evaluate, and demonstrate surrogate debris materials to validate and verify newly developed capabilities, and to realistically exercise field and fixed laboratory analytic and diagnostic processes.			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*	**Project (Number/Name)** RF / *Forensics Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
- Continue to develop, test, and demonstrate prototype ground-based prompt diagnostic technologies that improve sensor portability, with emphasis on size, weight, and power consumption reduction, and expand operational capability. - Initiate transition of advanced prompt diagnostics sensor prototype systems to the U.S. Prompt Diagnostics System. - Expand identification and documentation of improvised nuclear device (IND) signatures through modeling, simulation, and experiments, and develop tools and capabilities to support the attribution of IND detonations. - Evaluate capability to rapidly rule-in/rule-out known foreign devices using prompt and radiochemical signatures in a simulated realistic technology demonstration. - Continue to coordinate with partner nations to enhance and improve global U.S. nuclear forensics and attribution capabilities, under appropriate international agreements. - Initiate simulation of and assess source and propagation data for site-specific signatures from evasive and low-yield underground nuclear explosions. - Continue to develop algorithms and tools for collection and high-fidelity modeling and analysis of local seismic signatures of evasive and low-yield nuclear tests. - Collect and analyze physical response data from natural and man-made events that provide signals similar to those from low-yield, evasive underground nuclear explosions. Compare these data with results produced by computer simulation of the events. - Continue to develop advanced, modular radionuclide gas collection technologies in support of counterproliferation goals and compliance verification for the Non-Proliferation Treaty and the Comprehensive Test Ban Treaty. - Continue to develop advanced technologies to detect and monitor low-yield nuclear tests, including novel techniques for collecting and observing material and electromagnetic emissions and source-region seismic signatures.			
FY 2019 Plans: - Lead a DoD and interagency, end-to-end nuclear forensics process technology demonstration and evaluation of DTRA-developed technologies/methodologies to assess NTNF process improvements and identify potential capability gaps in forensic conclusion confidence, timeliness, and accuracy, and assist in assessing contribution to interagency attribution process and decisions. - Demonstrate 50% decrease in the material nuclear forensics fixed lab process timeline, with increased confidence and decreased technical uncertainties, improving capacity to make conclusions with low uncertainty and high confidence in a relevant timeframe. - Support Discreet Oculus ground-based prompt diagnostics sensor system in support of transfer/transition to USAF U.S. Prompt Diagnostics System (USPDS) program of record. - Complete design, build and installation of regional array, in preparation for transition of array to partner organization.			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*	**Project (Number/Name)** RF / *Forensics Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
- Modify Forensics Inversion Tool Suite (FITS) and Design Signature Database (DSD) forensic tools to better meet stakeholder needs for forensic devices. Los Alamos National Lab FITS tool modifications are being done in conjunction with the Stockpile program. - Prepare to transition recently developed device assessment research and development capabilities to partners at the National Nuclear Security Administration. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease from FY 2018 to FY2019 is due to the transition of monitoring and verification technology efforts from Project RF to Project RD.			
Accomplishments/Planned Programs Subtotals	36.738	40.286	33.578

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 20/0602718BR: *Counter Weapons of Mass Destruction Applied Research*	9.176	10.274	10.257	-	10.257	10.466	10.675	10.894	11.123	Continuing	Continuing
• 122/0605000BR: *Counter Weapons of Mass Destruction Systems Development*	4.479	6.241	6.163	-	6.163	4.821	5.340	5.602	5.720	Continuing	Continuing

Remarks

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year. (This is Priority Goal 4.1.2, as cited in U.S. Department of Defense Agency Strategic Plan for Fiscal Years 2015-2018, in support of Strategic Objective 4.1, "Preserve investments to maintain our decisive technological superiority.")

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*	**Project (Number/Name)** RG / *Defeat Technologies*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RG: *Defeat Technologies*	116.069	18.819	22.161	49.277	-	49.277	24.491	24.108	24.578	25.010	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Defeat Technologies project develops, integrates, demonstrates, and transitions innovative kinetic and non-kinetic weapon capabilities to expand traditional and asymmetric options available to Combatant Commanders to deny, disrupt, and defeat Weapons of Mass Destruction (WMD) while minimizing collateral effects. Technology development focuses on the physical or functional defeat of (1) chemical, biological, nuclear, and radiological threat materials, (2) an adversary's ability to deliver the same, as well as (3) the physical and non-physical support networks enabling both. This program achieves these goals through the systematic identification and maturation of technologies capable of defeating WMD agents or agent-based processes, then integrating them into weapons, delivery systems, or rapid WMD elimination capabilities. This effort includes developing specific WMD agent/agent-based process simulants, test infrastructure, and sampling capability required for effective development, testing, and evaluation of next generation capabilities to ensure optimum weapon solutions are achieved. Requirements are delineated in Agency Priority Lists for lethal and non-lethal Countering WMD (CWMD) capability. Based on specified requirements, weapons and capabilities are transitioned to a Service program of record for system acquisition.

DTRA's Counter- Improvised Explosive Device / Counter - Small Unmanned Aerial Systems (C-IED/C-sUAS) mission includes three primary lines of effort - attack the supporting threat network, protecting US forces, and building partner capacity. Since DTRA already provides this support in helping the Department counter IEDs for the US joint force, it follows that DTRA is the most-appropriate Department asset to undertake this C-sUAS coordination mission - to provide counter threat network support to deployed forces, C-IED/C-sUAS technology solutions, C-IED/C-sUAS training support (deploying and deployed US joint forces), and building partner nation capacity all while coordinating the overall Department's (C-IED/C-sUAS) efforts.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: RG: Defeat Technologies	18.819	22.161	49.277
Description: Project RG develops advanced technologies and weapon concepts and validates their applicability to CWMD.			
FY 2018 Plans: - Conduct dynamic sled tests of full-scale Heated And Mobile Munition Employing Rockets (HAMMER) weapon system and prepare for technology transition starting in FY 2019. - Conduct full-scale demonstration of access denial and denial-of-use technologies against WMD representative targets. - Accomplish static testing of a full-scale Agent Defeat Penetrator weapon system against a representative WMD target. - Continue development and testing of a new access denial weapon concept. - Continue to develop technologies in support of agent defeat and associated facilities. - Continue to develop and test diagnostic capability to meet emerging needs for agent defeat. - Conduct Modular Autonomous Counter-WMD System (MACS) follow-on incremental component/system demonstration.			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*	**Project (Number/Name)** RG / *Defeat Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
- Conduct functional defeat system demonstration. - Develop and integrate (MACS) Family of Systems Enabling Technologies in preparation for a system demonstration. ***FY 2019 Plans:*** - Complete full scale development and testing of Agent Defeat Penetrator weapon in preparation for its consideration in a USAF analysis of alternatives. - Continue full scale prototype demonstration of novel access denial technology in an operational environment. - Build-out prototype of second version of autonomous system and demonstrate system and payload in a relevant environment. - Collect signatures on IED/sUAS in a predictive environments using modeling & simulation. - Provide advanced infrastructure to improve collection of signatures including sensors, lab and field equipment, collection software, and collection tools. - Provide advanced IED/sUAS library analytics to improve database management (including entry, creation of information and vetting of information), search functionality, and 3rd party database queries. - Provide curation, dissemination, and access to collected data. - Develop and establish standardized data collection protocols. - Build, procure, and validate advanced and improvised threats to assist in threat risk analysis. - Develop IED/sUAS Identify Friend or Foe (IFF) low cost solutions to support U.S. forces and improve sensor detection while decreasing false alarm rates and reporting. - Identify and develop passive threat detections for IED/sUAS systems as the technology continues to develop in private industry. - Develop counter-measures to detect and defeat multi-agent enemy IED/sUAS. - Develop acoustic disrupters to defeat enemy IED/sUAS. - Improve sensor integration of C-IED/C-sUAS systems to improve detection and defeat capabilities and reduce the human in the loop. - Develop capability for manned aircraft to detect IED/sUAS in order to protect manned aircraft from potential threat IED/sUAS effects. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase from FY 2018 to FY 2019 is due to the net effect of the realignment of funds to support experimental activities in Project RM and requirements in Project RE and increased investment to counter small Unmanned Aerial Systems (UAS), (i.e., Tier 1 and 2 UAS), including rotary and fixed winged systems.			
Accomplishments/Planned Programs Subtotals	18.819	22.161	49.277

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*	**Project (Number/Name)** RG / *Defeat Technologies*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 20/0602718BR: *Counter Weapons of Mass Destruction Applied Research*	10.428	11.060	12.959	-	12.959	13.262	13.222	13.436	13.634	Continuing	Continuing

Remarks

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year. (This is Priority Goal 4.1.2, as cited in U.S. Department of Defense Agency Strategic Plan for Fiscal Years 2015-2018, in support of Strategic Objective 4.1, "Preserve investments to maintain our decisive technological superiority.")

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*	**Project (Number/Name)** RI / *Nuclear Survivability*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RI: *Nuclear Survivability*	44.529	5.964	6.658	5.783	-	5.783	5.946	6.025	6.156	6.285	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Nuclear Survivability project develops, integrates, demonstrates, and transitions innovative technologies for the protection of mission-essential personnel, critical military and national defense capabilities, and associated control and support systems during a nuclear event. Research under this project supports the mission critical systems identified under Department of Defense (DoD) Instruction 3150.09, Chemical, Biological, Radiological, and Nuclear (CBRN) Survivability Policy. The Defense threat Reduction Agency (DTRA) is the DoD-designated center of excellence for electromagnetic pulse survivability assessments. The System Vulnerability and Assessment effort develops nuclear assessment capabilities to support operational planning, weapon effects predictions, and strategic system design. This activity also provides the DoD's nuclear design and protection standards for new and existing systems, e.g., command and control facilities and aircraft. Key systems include the Nuclear Command and Control system, the net-centric thin-line, and both military and civilian satellites and associated support systems. The radiation-hardened nano-electronics effort develops and integrates radiation-hardened, high-performance prototype nano-electronics to meet DoD space and strategic deterrence system requirements. The Human Survivability effort supports the Nuclear Test Personnel Review Program (NTPR), confirming the participation of Atomic Veterans in nuclear testing and radiological events and providing radiation dose assessments. The NTPR is administered by the Department of Veterans Affairs and the Department of Justice for radiogenic disease compensation programs.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: RI: Nuclear Survivability	5.964	6.658	5.783
Description: Project RI develops, integrates, and transitions novel technologies that radically enhance the survivability and resilience of DoD nuclear forces and their associated control and support systems in the event of an attack or other hostile action.			
FY 2018 Plans: - Continue producing technical reports addressing DoD radiogenic disease concerns; which address Congressional interest in historical veteran radiation exposure and present day radiological exposures of the DoD-affiliated population. - Complete development of the Satellite System Natural and Nuclear Environment Protection Standard. - Initiate development of the Satellite System Natural and Nuclear Environment Protection Handbook. - Complete update of the North Atlantic Treaty Organization (NATO) Allied Engineering Publication AEP-04 Nuclear Survivability Criteria for Armed Forces Material and Installations.			
FY 2019 Plans: - Produce appropriate new or updated standards and handbooks to capture critical information for DoD to verify and validate mission critical systems.			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*	**Project (Number/Name)** RI / *Nuclear Survivability*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
- Coordinate Satellite System Natural and Nuclear Environment Protection Standard with DoD Stakeholders and the DoD Standardization Program Office. - Continue producing technical reports addressing DoD radiogenic disease concerns; which address Congressional interest in historical veteran radiation exposure and present day radiological exposures of the DoD-affiliated population. - Evaluate Commercial Off the Shelf (COTS) radiation-hardened microelectronics from trusted, commercial sources. - Conduct research to characterize radiation-hardened materials and determine viability for inclusion in DOD systems. - Final independent verification and validation (IV&V) of DIAMONDS coding and data prior to migration to DIAMONDS Next Generation. - Codify the Information Assurance and Accreditation documentation for the transition from DIAMONDS to DIAMONDS Next Generation. Provide supporting documentation to DISA for DIAMONDS cloud operation in support of Federal Data Center Consolidation Initiative. - Commence concurrent DIAMONDS and DIAMONDS Next Generation testing for functional and data validation. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease from FY 2018 to FY 2019 is due to reduced investment in stockpile logistics and Mighty Guardian.			
Accomplishments/Planned Programs Subtotals	5.964	6.658	5.783

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 20/0602718BR: *Counter Weapons of Mass Destruction Applied Research*	30.085	34.103	32.732	-	32.732	33.723	34.479	32.915	33.841	Continuing	Continuing

Remarks

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year. (This is Priority Goal 4.1.2, as cited in U.S. Department of Defense Agency Strategic Plan for Fiscal Years 2015-2018, in support of Strategic Objective 4.1, "Preserve investments to maintain our decisive technological superiority.")

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / *Counter Weapons of Mass Destruction Advanced Technology Development	Project (Number/Name) RL / Nuclear & Radiological Effects	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RL: *Nuclear & Radiological Effects*	0.000	3.390	3.500	3.427	-	3.427	3.426	3.424	3.424	3.497	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Nuclear and Radiological Effects project develops, integrates, and transitions nuclear and radiological assessment modeling tools for use in military planning processes. The assessment modeling tools provide critical analytics for Consequence of Execution (COE) considerations during nuclear targeting and post-detonation nuclear response, supporting interagency strategic and tactical decision making. These COE considerations can include the full range of political, military, economic, social, infrastructure, and information (PMESII) factors and their interaction, extending analytical capabilities beyond common damage assessment practices and into second and third order effects. These activities/efforts support Combatant Commands and other Department of Defense (DoD) organizations by providing accurate and reliable consequence assessment and response information.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: RL: Nuclear and Radiological Effects	3.390	3.500	3.427
Description: Project RL develops nuclear and radiological assessment modeling tools to support military operational planning, weapons effects predictions, and strategic system design decisions. ***FY 2018 Plans:*** - Continue to add militarily significant nuclear weapon effects to tools specifically designed for transition to military targeting systems. - Continue to add militarily significant nuclear weapon effects to tools specifically designed to support nuclear survivability and standards formulation. ***FY 2019 Plans:*** - Develop natural gas and water/seawater effects models in support of U.S. Strategic Command (USSTRATCOM) Consequences of Execution (COE) efforts, linking higher order effects to PMESII analyses. - Integrate, demonstrate, and deliver a suite of consistent and enhanced models, tools, references, and data to US and Allied nuclear weapon effects stakeholders. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change.			
Accomplishments/Planned Programs Subtotals	3.390	3.500	3.427

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*	**Project (Number/Name)** RL / *Nuclear & Radiological Effects*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 20/0602718BR: *Counter Weapons of Mass Destruction Applied Research*	26.419	29.228	29.388	-	29.388	30.054	30.723	31.413	32.072	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year. (This is Priority Goal 4.1.2, as cited in U.S. Department of Defense Agency Strategic Plan for Fiscal Years 2015-2018, in support of Strategic Objective 4.1, "Preserve investments to maintain our decisive technological superiority.")

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / *Counter Weapons of Mass Destruction Advanced Technology Development*	Project (Number/Name) RM / *WMD Counterforce Technologies*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RM: *WMD Counterforce Technologies*	150.509	23.041	24.663	25.243	-	25.243	25.905	26.911	27.520	28.097	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Weapons of Mass Destruction (WMD) Counterforce Technologies project develops, integrates, demonstrates, and transitions emerging technologies enabling efforts to find, characterize, assess, and plan for the defeat of WMD threats. There are three core research efforts in this project: (1) The WMD battlespace awareness effort provides warfighters with capabilities to find, characterize, and assess WMD threats. This effort develops and integrates sensing technologies with multi-mission Unmanned Aerial System payloads. (2) The Countering WMD (CWMD) weapons effects effort develops modernized, fast-running, validated CWMD planning tools and integrates modeling and simulation software to optimize the execution of WMD and associated hard target defeat operations. (3) The Innovative Technologies and Engineering effort takes promising technologies discovered under fundamental and basic research and further develops them to increase the effectiveness of weapons against blast doors and other underground structures for functional defeat of Underground Facilities (UGFs), WMD, and their delivery systems.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: RM: WMD Counterforce Technologies	23.041	24.663	25.243
Description: Project RM provides: (1) full-scale testing of CWMD weapons effects, weapon effects modeling, and weapon delivery system optimization; and (2) WMD sensor, surveillance, and data processing technologies.			
FY 2018 Plans: - Demonstrate sample extraction prototype capability for rapid sampling of hazardous chemicals from solid storage. - Continue to demonstrate enhanced WMD sample collection and analysis systems for low-visibility search operations. - Demonstrate mission planning and analytical tools for chemical -search operations, including sensor emplacement and source attribution. - Design, test, and integrate agitation and injection system upgrades to increase target prosecution efficiency and effectiveness. - Conduct End-User Evaluations and Operational Evaluations in specific test series to gain operator perspective and to determine system effectiveness and operational utility against WMD targets in representative environments. - Begin phase two of three new software architecture developments, allowing WMD defeat modeling and simulation planning tools (i.e., Integrated Munitions Effects Assessment (IMEA) ,and Vulnerability Assessment and Protection Option (VAPO) to more quickly and efficiently enhance integration with planning tools used by partner agencies and international allies. . - Conduct proof of concept demonstrations for enhanced area search sensors and capabilities for biological weapon search missions.			
FY 2019 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*	**Project (Number/Name)** RM / *WMD Counterforce Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
- Complete Chemical Intelligence, Surveillance, and Reconnaissance (ISR) area search mission planning tool proof of concept to enhance capabilities to search for, detect, and identify chemical threats prior to release. - Transition the Loop-mediated isothermal Amplification (LAMP), the Biological ISR Sample Collection (SCOUT), and the Sampling Capability Improvement Project (SCIP) to the Joint Program Executive Office – Chemical and Biological Defense (JPEO-CBD) in support of Biological ISR sample collection capability improvements. - Conduct mission-oriented experiments to model, simulate, analyze, or exploit technical capabilities intended to counter WMD or mitigate risks and impacts to critical assets in operationally relevant conditions. - Release updated version of modernized, fast-running, validated IMEA, a CWMD modeling and simulation (M&S) planning tool, incorporating near-miss lethality, weapons data, and concrete modeling, to optimize the execution of WMD and associated hard target defeat operations. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase from FY 2018 to FY 2019 is due to increased investment in disruptive technologies and experiments.			
Accomplishments/Planned Programs Subtotals	23.041	24.663	25.243

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 20/0602718BR: *Counter Weapons of Mass Destruction Applied Research*	11.702	14.552	12.780	-	12.780	12.991	13.736	13.483	14.081	Continuing	Continuing

Remarks

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year. (This is Priority Goal 4.1.2, as cited in U.S. Department of Defense Agency Strategic Plan for Fiscal Years 2015-2018, in support of Strategic Objective 4.1, "Preserve investments to maintain our decisive technological superiority.")

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / *Counter Weapons of Mass Destruction Advanced Technology Development*	Project (Number/Name) RR / *Countering WMD Test and Evaluation*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RR: *Countering WMD Test and Evaluation*	16.052	0.000	12.500	12.394	-	12.394	12.389	12.389	12.389	12.649	Continuing	Continuing

Note

**Project RR title changes from Combating WMD Test and Evaluation to Countering WMD Test and Evaluation beginning in FY 2017.

A. Mission Description and Budget Item Justification

The Countering WMD Test and Evaluation Project RR provides a unique national test bed capability for simulated weapons of mass destruction (WMD) facility characterization, weapon-target interaction, and WMD facility defeat testing to respond to operational needs by developing and maintaining test beds used by the Department of Defense (DoD), the Military Services, the Combatant Commanders and other Federal Agencies to evaluate the implications of WMD, conventional, and other special weapon use against U.S. military or civilian systems and targets.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: RR: Countering WMD Test and Evaluation	0.000	12.500	12.394
Description: Project RR provides a unique national test bed capability for simulated WMD facility characterization, weapon-target interaction, and WMD facility defeat testing.			
FY 2018 Plans: - Support Combatant Command exercises and planning events at the Nevada Test Bed in order to develop missile defeat technologies, tools, and capabilities. - Develop interagency capabilities and special tests in support of national priority programs and mission requirements. - Augment scheduling, test planning, maintenance and analysis capabilities for missile defeat technology tests and demonstrations.			
FY 2019 Plans: - Continue support for Combatant Command exercises and planning events at the Nevada Test Bed in order to develop target defeat technologies, tools, and capabilities. - Maintain and further develop interagency capabilities and special tests in support of national priority programs and mission requirements. - Support the planning, execution, and analysis of two major CWMD test and demonstration events at the Nevada National Security Site or other locations within or outside the continental U.S.			
FY 2018 to FY 2019 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*	**Project (Number/Name)** RR / *Countering WMD Test and Evaluation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
No significant change.			
Accomplishments/Planned Programs Subtotals	0.000	12.500	12.394

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 20/0602718BR: *Counter Weapons of Mass Destruction Applied Research*	13.501	13.652	14.435	-	14.435	14.816	15.156	15.451	15.775	Continuing	Continuing

Remarks

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year. (This is Priority Goal 4.1.2, as cited in U.S. Department of Defense Agency Strategic Plan for Fiscal Years 2015-2018, in support of Strategic Objective 4.1, "Preserve investments to maintain our decisive technological superiority.")

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / *Counter Weapons of Mass Destruction Advanced Technology Development*	Project (Number/Name) RT / *Target Assessment Technologies*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RT: *Target Assessment Technologies*	254.739	39.202	27.185	23.871	-	23.871	23.313	23.908	24.419	24.931	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Target Assessment Technologies project develops, integrates, tests, demonstrates, and transitions processes and technologies providing advanced capabilities in the areas of Weapons of Mass Destruction (WMD) target assessment and functional defeat. The functional defeat process includes finding and identifying a facility, characterizing its function and physical layout, determining current or future vulnerabilities to available defeat mechanisms, planning and executing an attack, assessing damage, and denying reconstitution efforts. Applying these processes to time-dependent constraints related to WMD target characterization and threat analysis presents a further technical challenge. This project develops analytical tools and processes required to (1) find and characterize WMD targets and associated hard and deeply buried targets (HDBTs) and to (2) to assess in real time the results of physical and functional defeat operations (such as a direct attack). These novel, dynamic capabilities enable Combatant Commands (CCMDs) and the intelligence community (IC) to hold at risk high value targets possessed by adversaries.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: RT: Target Assessment Technologies	39.202	27.185	23.871
Description: Project RT provides CCMDs and the IC with technologies and processes to find and characterize WMD targets and hard and deeply buried targets and then assess the results of attacks against those targets. ***FY 2018 Plans:*** - Complete prototype development, final documentation, and technical report in preparation for transition of a deployable remote ground sensor project. - Develop detailed feasibility study and program plan for WMD and Hard Target automated characterization capability. - Continue to develop comprehensive soil model library for support of geotechnical site characterization of WMD target sites. - Refine and enhance WMD complex modeling capabilities for integration with automated target characterization. - Integrate functional defeat and "pattern of life" models into automated target characterization capability. - Deliver enhanced counter-WMD and underground facility (UGF) schoolhouse training exercises to IC and Combatant Commands. ***FY 2019 Plans:*** - Complete engineering rule-based development for automated advanced targeting characterization efforts to meet CCMD and IC WMD and HDBT characterization and defeat requirements. - Further develop the Functional Defeat Enterprise process including identifying facility functions, determining defeat vulnerabilities in support of attack planning and execution, and determining new battle damage information methods.			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603160BR / **Counter Weapons of Mass Destruction Advanced Technology Development*	**Project (Number/Name)** RT / *Target Assessment Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
- Develop cooperative CWMD project technical exchange with the United Kingdom (UK) in support of a U.S./UK Project Agreement. - Continue to develop complex geotechnical models for support of geotechnical site characterization of WMD target sites. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease from FY 2018 to FY 2019 is due to decreased investment in target sensing technologies and WMD target engagement to fund higher priority baseline test and demonstration requirements across the counter-WMD research and development portfolio.			
Accomplishments/Planned Programs Subtotals	39.202	27.185	23.871

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year. (This is Priority Goal 4.1.2, as cited in U.S. Department of Defense Agency Strategic Plan for Fiscal Years 2015-2018, in support of Strategic Objective 4.1, "Preserve investments to maintain our decisive technological superiority.")

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Defense Threat Reduction Agency	Date: February 2018
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 0604134BR / *Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing*

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	12.993	242.668	255.661	12.743	13.207	13.656	13.942	Continuing	Continuing
JS: *Assist Situational Understanding*	-	0.000	0.000	0.000	13.141	13.141	0.000	0.000	0.000	0.000	Continuing	Continuing
JR: *Enable DoD Responsiveness*	-	0.000	0.000	0.000	7.725	7.725	0.000	0.000	0.000	0.000	Continuing	Continuing
JC: *Enable Rapid Capability Delivery*	-	0.000	0.000	12.993	221.802	234.795	12.743	13.207	13.656	13.942	Continuing	Continuing

Note

PE 0604134BR / Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing activities were previously authorized and appropriated under the Joint Improvised-Threat Defeat Fund (JIDF).

A. Mission Description and Budget Item Justification

The Counter Improvised-Explosive Device (C-IED) Counter Improvised-Threat (Counter-IT) Technology Demonstration, Prototype Development, and Testing program element supports the development, demonstration, and testing of defeat technologies for advanced wireless signals, compatible electronic counter-measures for IED and IED-facilitation defeat/neutralization, miniaturized and integrated sensors, hand-held detectors, and cutting edge Information Technology enabler capabilities.

This includes providing and enabling open, fully sharable information, and analytical software tools; situational understanding of the threat's tactics, techniques, and procedures (what is urgent and emerging); C-IED and related C-IT material solutions prototyping, experimentation, development, and delivery; and training integration support to ensure deploying and deployed forces' readiness is sustained as new equipment and methods are delivered.

Assist Situational Understanding (JS) of threat-network activities. The IED and other disruptive improvised threats represent a continuing and irregular threat for deployed U.S. and coalition forces. In order to counter the threat, a deep understanding of IED and improvised threat use and facilitation is required. This DTRA capability is enabled by an advanced information technology infrastructure, analytical software tools, deployed and embedded DTRA operations integrators and intelligence analysts, and current and integrated operational data. Supported by CONUS-based reach-back linked to the intelligence community, the inter-agency, and coalition partners, analytics, when combined with production from the Defense Intelligence Enterprise, enables more complete threat awareness and understanding by deploying and deployed US forces to support their planning and targeting. This core function also informs research and development and threat-based rapid prototyping investment decisions, guides international and interagency coordination to enable counter threat-network support, and supplements U.S. Joint Force pre-deployment training to ensure the most recent threat is understood and new counter improvised threat systems can be properly utilized.

Enable DoD Responses to Improvised Weapons (JR). DTRA builds counter-IED and improvised threat solutions in full collaboration with its partners. Through a robust communities of action approach, DTRA coordinates with the Combatant Commanders (CCDRs), the Joint Staff, the Military Departments/Services, the interagency,

coalition partners, industry, and academia to develop counter IED and improvised threat solutions that further enable the maneuverability and force protection of deployed U.S. Joint Forces. This methodology leverages the authorities, access, and capabilities of the entire U.S. Government and its partners to garner support for counter IED and improvised threat development and delivery.

Enable Rapid Capability Delivery (JC). Understanding the threat drives a DTRA deliberate, structured, and proactive approach to identify and validate urgent or emergent capability gaps and requirements. DTRA's continuous embedded presence with deployed U.S. Joint Forces enables early identification and understanding of C-IED and C-IT gaps, vulnerabilities, and risks and the timely validation, resourcing, development, and delivery of C-IED and C-IT material and non-material solutions. DTRA technical integrators embedded with deployed forces further enables rapid adjustments to solutions as the threat's adaptation evolves.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	12.993	242.668	255.661
Total Adjustments	0.000	0.000	12.993	242.668	255.661
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Establish RDT&E Appropriation	-	-	12.993	242.668	255.661

Change Summary Explanation

The increase from FY 2018 to FY 2019 is due to the establishment of the 0604134BR / Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing program element in the RDT&E appropriation. This reflects the realignment of the DTRA-JIDO research and development activities in accordance with Congressional intent to terminate the Joint Improvised-Threat Defeat Fund in section 9015 of the Chairman's recommendation to the Senate Appropriations Committee for the Department of Defense Appropriations Bill, 2018 (FY 2018 Baseline: $0 million.)

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604134BR / *Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing*	Project (Number/Name) JS / *Assist Situational Understanding*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
JS: *Assist Situational Understanding*	-	0.000	0.000	0.000	13.141	13.141	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project enables DTRA to understand and analyze global threat information. It is an Information Technology (IT) Operations quick-reaction capability supported by the rapid collection, fusion, and dissemination of operational-intelligence, and technology in order to enable the defeat of threat networks that employ disruptive technologies.

The JIDO advanced Mission Information Technology (MIT) capability, its software Systems Integration Lab (SIL), and embedded CCMD-direct support and reachback staff, continuously create capabilities to ingest, fuse, analyze, and present mission relevant data and information that provides immediate assistance to DoD and the whole of government. This capability, called Catapult, is a fully accredited SIPR and JWICS based analytical cloud architecture. The Catapult architecture pulls from over more than 850 SIPR and more than 170 JWICS data sources and allows for simple and open data access, system stability, scalability, and advanced analytics. In addition to Catapult, the MIT created another significant capability called Voltron. Voltron provides analysts access to SIGINT data within a secure and IC-accredited software developer environment. Voltron, give analysts access to continuously new models in support of “Attack the Network” analysis and operations. Voltron provides analysts access to methodologies involving multi-INT fusion in an easy to use interface. These methods are based on years of experience supporting tactical targeting environment and built in collaboration with other teams across the Intelligence Community. There are currently more than 75 models in Voltron available to the user community.

DTRA's authorities and mission have enabled a unique “Path-to-Production” (PTP) for mission-driven IT solutions. This unique development environment includes an integrated Cyber Security Assessment and Authorization (A&A) process, an in-house collateral Authorizing Official (AO), a strong partnership between technologists and intelligence analysts working real-world problems, and a collaborative and innovative culture that launches practical software solutions rapidly.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: JS: Assist Situational Understanding	0.000	0.000	0.000	13.141	13.141
FY 2018 Plans: N/A					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604134BR / *Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing*	**Project (Number/Name)** JS / *Assist Situational Understanding*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2019 OCO Plans:*** - Effort to consolidate Web Visualizations for DTRA IED/sUAS data. This will include the Common Intelligence Picture/Common Operational Picture and technical data and will serve as the platform for creation of C-IED/C-sUAS analytics. - Build a data science enabled module that will crawl through Catapult reporting and identify reports related to IED/sUAS events. Through machine learning techniques and application of training data, the team will train this module to identify reports that normal queries may miss. These reports will serve as the base data set for the C-IED/C-sUAS event table. - Prepare a list of vetted IED/sUAS events pulled from Catapult reporting. Events will be broken down into relevant categories with associated attributes. - Stand up a database of technical data associated with known IED/sUAS. Library will be available for direct query and incorporated into other C-IED/C-sUAS capabilities. - Integrate Virtual Management System processes and capabilities to build 3D models for various maritime vessels requested by external SOF customer. - Develop and test a software mapping tool and spatial data analytics technology web service capable of a providing user functionality to create basic geospatial analytic outputs (i.e., line of sight, route vulnerability, etc.). - Generate additional Data Science tables populated with entities extracted from Catapult using RipIt regex trees. This will provide a “truth set” for future Natural Language Processing. - Develop and Test new tools allowing for the visualizing (and effects) of underwater explosions. - Develop a new application (Thor) as a “rules-based” approach to existing Avengers/Phoenix models. Thor is planned to enhance sensitive site exploitation (SSE) data with a tool will provide comprehensive approach to SSE vetting. - Develop capability to visualize and derive trends for Air and Marine Operations Center non-commercial flight data. - Develop and test an Interactive interface which will provide access to the Avenger tool suite on selective networks. - Scope and Design the Data Science software and tool development environment as to create containerized tools which will provide a standard working image across the multiple networks. - Provide a methodology to leveraging contextual clues from reporting, provide additional information about individual person entities extracted from reports. (i.e., job title).					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604134BR / *Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing*	**Project (Number/Name)** JS / *Assist Situational Understanding*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Develop and Test custom webpages that will provide “pre-vetted” data against analyst problem set. Automated workflow built for specific customer needs. - Develop and test a web-based Horizon version to act as a location intelligence discovery tool. The tool will provide geospatial querying within 2D maps to users as a light weight alternative to the smart-client version. - Develop and test a web-based C2IS2 tool that will provide OP/INTEL users with the capability to capture and manage the processes, observables, and signatures associated with IED operations and use that data for training, analysis, collection planning, and exploitation. - Continued improvements to the JIDO DevOps Pipeline and maturing the approach to delivery using containers - Deploy a subset of the Attack the Network Tool Suite (ANTS) application on Non-Classified Local Area Network and an easy navigation directory. - Provide Integration and Test activities against a Battlefield Information Collection and Exploitation System (BICES) instance of Catapult. Upgrade and test all applications to work with Metrics across the ANTS Suite, upgrade the user account and authentication in relation to the F5/Certificate Authentication System, and deploy Horizon Web. - Conduct System Integration of Catapult and all ANTS applications on the new HP Moonshot hardware. - Support proper deployment procedures and provide a test environment for the newly deployed Catapult and ANTS related applications on HP Moonshot hardware. - Test all Catapult and all ANTS applications at a COOP location. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase from FY 2018 to FY 2019 is due to the establishment of Project JS-Assist Situational Understanding in Program Element 0604134BR / Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing in the RDT&E appropriation. This reflects the realignment of the DTRA-JIDO research and development activities in accordance with Congressional intent to terminate the Joint Improvised-Threat Defeat Fund in section 9015 of the Chairman's recommendation to the Senate Appropriations Committee for the Department of Defense Appropriations Bill, 2018 (FY 2018 Baseline: $0 million.)					
Accomplishments/Planned Programs Subtotals	0.000	0.000	0.000	13.141	13.141

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604134BR / *Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing*	**Project (Number/Name)** JS / *Assist Situational Understanding*

D. Acquisition Strategy

Assessment and selection of best performer to provide contractual services to develop and operationalize requirements through the new Enterprise Acquisition Strategy Initiative (EASI) at the least risk, optimal cost and proven technically. Performer base selection includes research developers across DoD and other Government agency laboratories, academia, and industry.

E. Performance Metrics

Performing contractors operate under a Cost Plus\Award Fee contract measured by a number of mutually agreed Service Level Agreements (SLAs). Measurement \Awards is done semi-annually. The contractor is required to provide Monthly status and progress against the SLAs.

System metrics are measured by usage to include network, number of users, data, scope, integrations, and access.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604134BR / *Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing*	**Project (Number/Name)** JS / *Assist Situational Understanding*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Attack the Network Suite (MIT) - Systems Integration Lab (SIL) - Direct Operations Support	C/CPAF	Booz Allen Hamilton : Reston, VA	-	-		-		0.000		1.622	Dec 2018	1.622	Continuing	Continuing	-
Attack the Network Suite (MIT) - Systems Integration Lab (SIL) - Mission IT Capability Development (Automation and Data Science)	C/CPAF	Booz Allen Hamilton : Reston, VA	-	-		-		0.000		0.695	Dec 2018	0.695	Continuing	Continuing	-
QRC IT Network (OIR)	C/CPAF	Booz Allen Hamilton : Reston, VA	-	-		-		0.000		1.391	Mar 2019	1.391	Continuing	Continuing	-
QRC IT Network (RS)	C/CPAF	Booz Allen Hamilton : Reston, VA	-	-		-		0.000		1.391	Mar 2019	1.391	Continuing	Continuing	-
		Subtotal	-	-		-		0.000		5.099		5.099	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Attack the Network Suite (MIT) - Systems Integration Lab (SIL) - Direct Operations Support	C/CPAF	Booz Allen Hamilton : Reston, VA	-	-		-		0.000		0.361	Dec 2018	0.361	Continuing	Continuing	-
Attack the Network Suite (MIT) - Systems Integration Lab (SIL) - Mission IT Capability Development (Automation and Data Science)	C/CPAF	Booz Allen Hamilton : Reston, VA	-	-		-		0.000		0.155	Dec 2018	0.155	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604134BR / *Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing*	Project (Number/Name) JS / *Assist Situational Understanding*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
QRC IT Network (OIR)	C/CPAF	Booz Allen Hamilton : Reston, VA	-	-		-		0.000		0.309	Mar 2019	0.309	Continuing	Continuing	-
QRC IT Network (RS)	C/CPAF	Booz Allen Hamilton : Reston, VA	-	-		-		0.000		0.309	Mar 2019	0.309	Continuing	Continuing	-
Combatant Command C-IED Exercise Support Intergration Program (J7)	MIPR	Various : N/A	-	-		-		0.000		1.811		1.811	Continuing	Continuing	-
		Subtotal	-	-		-		0.000		2.945		2.945	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Attack the Network Suite (MIT) - Systems Integration Lab (SIL) - Direct Operations Support	C/CPAF	Booz Allen Hamilton : Reston, VA	-	-		-		0.000		1.262	Dec 2018	1.262	Continuing	Continuing	-
Attack the Network Suite (MIT) - Systems Integration Lab (SIL) - Mission IT Capability Development (Automation and Data Science)	C/CPAF	Booz Allen Hamilton : Reston, VA	-	-		-		0.000		0.541	Dec 2018	0.541	Continuing	Continuing	-
QRC IT Network (OIR)	C/CPAF	Booz Allen Hamilton : Reston, VA	-	-		-		0.000		1.080	Mar 2019	1.080	Continuing	Continuing	-
QRC IT Network (RS)	C/CPAF	Booz Allen Hamilton : Reston, VA	-	-		-		0.000		1.081	Mar 2019	1.081	Continuing	Continuing	-
		Subtotal	-	-		-		0.000		3.964		3.964	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604134BR / *Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing*	**Project (Number/Name)** JS / *Assist Situational Understanding*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Attack the Network Suite (MIT) - Systems Integration Lab (SIL) - Direct Operations Support	C/CPAF	Booz Allen Hamilton : Reston, VA	-	-		-		0.000		0.361	Dec 2018	0.361	Continuing	Continuing	-
Attack the Network Suite (MIT) - Systems Integration Lab (SIL) - Mission IT Capability Development (Automation and Data Science)	C/CPAF	Booz Allen Hamilton : Reston, VA	-	-		-		0.000		0.154	Dec 2018	0.154	Continuing	Continuing	-
QRC IT Network (OIR)	C/CPAF	Booz Allen Hamilton : Reston, VA	-	-		-		0.000		0.309	Mar 2019	0.309	Continuing	Continuing	-
QRC IT Network (RS)	C/CPAF	QRC IT Network (RS) : Reston, VA	-	-		-		0.000		0.309	Mar 2019	0.309	Continuing	Continuing	-
		Subtotal	-	-		-		0.000		1.133		1.133	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		0.000		13.141		13.141	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604134BR / *Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing*	**Project (Number/Name)** JS / *Assist Situational Understanding*

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
N/A																												

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604134BR / *Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing*	**Project (Number/Name)** JS / *Assist Situational Understanding*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
N/A	1	2019	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604134BR / *Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing*	Project (Number/Name) JR / *Enable DoD Responsiveness*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
JR: *Enable DoD Responsiveness*	-	0.000	0.000	0.000	7.725	7.725	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project enhances U.S. Joint Forces' responsiveness to improvised weapons. DTRA builds counter-threat solutions in full collaboration with its partners. Through a robust communities of action approach, DTRA coordinates with the Combatant Commanders (CCDRs), the Joint Staff, the Military Departments/Services, the interagency, coalition partners, industry, and academia to develop C-IED and C-IT solutions that further enable the maneuverability and force protection of deployed U.S. Joint Forces. This methodology leverages the authorities, access, and capabilities of the entire U.S. Government and its partners as counter-improvised threat solutions are developed and realized.

DTRA responds to the following improvised threats: Home-Made Explosives (HME), Vehicle-Borne IED (VBIED), Unmanned Aerial Systems (UAS) Vehicle-Attached IED (VAIED), Anti-Armor IED (AIED) Buried IED, Radio Controlled IED (RCIED), Person-Borne IED (PBIED), Booby Trapped Structures (BTS), Improvised WMD, Water-Borne IED (WBIED), Tunnels, and emerging threats that are identified by the warfighter deployed forward.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: JR: Enable DoD Responsiveness	0.000	0.000	0.000	7.725	7.725
FY 2018 Plans: N/A					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: - Leverage capabilities and expertise primarily from Department of Defense University Affiliated Research Centers (UARCs) such as Georgia Tech Research Institute (GTRI) and Massachusetts Institute of Technology (MIT) Lincoln Labs. - Delivers technical reports in response to RFIs submitted by JIDO Program/System Integrators and JIDO Initiative Evaluation Team Members. - Conduct Joint Lab Board in support of rapid development and prototyping to counter improvised threats. - Conduct Hacking 4 Defense in support of rapid development and prototyping to counter improvised threats.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604134BR / *Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing*	**Project (Number/Name)** JR / *Enable DoD Responsiveness*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Develop Broad Area Announcement (BAA) solicitation in support of capabilities to counter improvised threats. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase from FY 2018 to FY 2019 is due to the establishment of Project JR-Enable DoD Responsiveness in Program Element 0604134BR / Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing in the RDT&E appropriation. This reflects the realignment of the DTRA-JIDO research and development activities in accordance with Congressional intent to terminate the Joint Improvised-Threat Defeat Fund in section 9015 of the Chairman's recommendation to the Senate Appropriations Committee for the Department of Defense Appropriations Bill, 2018 (FY 2018 Baseline: $0 million.)					
Accomplishments/Planned Programs Subtotals	0.000	0.000	0.000	7.725	7.725

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs. Performer base includes research developers across DoD and other Government agency laboratories, academia, and industry.

E. Performance Metrics

Percentage of completed Counter Improvised-Threat Technology demonstration programs transitioning to Warfighter each year.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604134BR / *Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing*	**Project (Number/Name)** JR / *Enable DoD Responsiveness*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Outreach	C/TBD	TBD : TBD	-	-		-		0.000		7.425	Mar 2019	7.425	Continuing	Continuing	-
		Subtotal	-	-		-		0.000		7.425		7.425	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CERDEC Electro-Magnetice MS Support	TBD	TBD : TBD	-	-		-		0.000		0.300	Dec 2018	0.300	Continuing	Continuing	-
		Subtotal	-	-		-		0.000		0.300		0.300	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		0.000		7.725		7.725	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604134BR / *Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing*	**Project (Number/Name)** JR / *Enable DoD Responsiveness*

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
N/A																												

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604134BR / *Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing*	**Project (Number/Name)** JR / *Enable DoD Responsiveness*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
N/A	1	2019	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604134BR / *Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing*	Project (Number/Name) JC / *Enable Rapid Capability Delivery*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
JC: *Enable Rapid Capability Delivery*	-	0.000	0.000	12.993	221.802	234.795	12.743	13.207	13.656	13.942	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project harnesses an in-depth understanding of the threat leading to identification and validation of urgent or emergent counter-threat requirements and Combatant Command capability gaps. In turn, DTRA-JIDO rapidly provides Counter - Improvised Explosive Device/ Counter- small Unmanned Aerial Systems (C-IED/C-sUAS) and C-IT solutions to prevent or mitigate battlefield operational surprise. DTRA's continuous embedded presence with deployed U.S. Joint Forces and coordination with Military Service components enables full transparency of investment activities and provides for the early identification and understanding of C-IED and C-IT risks and vulnerabilities which enable the timely validation, development, and delivery of counter-threat material and non-material solutions.

DTRA delivers counter-threat materiel solutions in support of US Joint Forces supporting contingency operations, effectively addressing changes to threat Tactics, Techniques, and Procedures (TT&P) affecting deployed forces. Capability incorporates an embedded tactical presence to understand a continuously evolving threat environment and complete visibility of the current DoD counter-threat portfolio to enable rapid response to warfighter vulnerabilities and to enhance force protection and maneuverability. DTRA responds to the following improvised threats: Home-Made Explosives (HME), Vehicle-Borne IED (VBIED), Unmanned Aerial Systems (UAS) Vehicle-Attached IED (VAIED), Anti-Armor IED (AIED) Buried IED, Radio Controlled IED (RCIED), Person-Borne IED (PBIED), Booby Trapped Structures (BTS), Improvised WMD, Water-Borne IED (WBIED), Tunnels, and emerging threats that are identified by the warfighter deployed forward.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: JC: Enable Rapid Capability Delivery	0.000	0.000	12.993	221.802	234.795
FY 2018 Plans: N/A					
FY 2019 Base Plans: - Conduct and participate in test and evaluation events in support of improvised threats. - Develop and test C-IED/C-sUAS systems for compatibility prior to systems deploying to operational theaters in support of the warfighter. - Maintain production platforms that support the development and fielding of capabilities that combat improvised threats and the network. - Improve deployable forensic field kits to provide near real time feedback and reduce the reach back support requirement.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604134BR / *Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing*	**Project (Number/Name)** JC / *Enable Rapid Capability Delivery*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Conduct modeling and simulation in support of countering improvised threats - Continue threat device characterization, prototyping and production.					
FY 2019 OCO Plans: - Increase Positive Detection (PD) and acceptable False Alarm Rate (FAR) with multiple integrated sensors in Latest Time of Value (LTOV) in support of Standoff Detection of improvised threats - Improve size, weight, power and integration of sensors to small unmanned systems. - Improve on-board vs. off-board data processing to provide real time data in unmanned systems to support real-time improvised threat detection. - Develop Magnetometers that can detect items emplaced on vehicle and report to mobile app in support of VAIED friendly notification. - Develop the ability to reverse polarity of the vehicle upon emplacement of magnet in support of VAIED. - Improve video monitoring/physical security in support of VAIED notification. - Identify and develop technology that is portable enough to look through walls and identify hazards with fidelity in real-time for BTS. - Develop imagery that can provide fidelity to operator and complete inspection of room in support of BTS - Proof of concept for unmanned vehicle that can autonomously operate within confined spaces and provide necessary imagery to operator for BTS - Integrate sensor to detect various anomalies in unstructured environment with the ability to detect through clothes and report in real-time at safe standoff distances in support of PBIED - Identify / develop biometry and non-cooperative biometrics from standoff distance in support of behavioral prediction and tracking in uncontrolled environments in support of PBIED. - Obtain baseline threat signatures for vehicles to support sensor development for VBIED detection. - Improve bulk explosive detection through metal at standoff distance in support of VBIED. - Improve automatic slewing of sensors and non-lethal vehicle/driver stopping technologies for stopping VBIED. - Develop counter measures for RCIED's based on the evolving global network environments (4G, LTE and 5G). - Identify alternative methods to Common Timing Protocol (CTP) for current and future Electronic Counter Measure (ECM) capabilities. - Develop remote neutralization of HME and pre-cursors: through the use of chemical neutralization, dilution solutions, and dispersants while controlling the thermal degradation to target HME manufacturing without putting the warfighter in harm's way.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604134BR / *Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing*	**Project (Number/Name)** JC / *Enable Rapid Capability Delivery*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Improve / develop threat Improvised Explosive Device/small Unmanned Aerial Systems (IED/sUAS) detect and defeat capabilities against future technology: acoustic detection at range, machine learning of constantly changing threat signatures (acoustic, RF signal, radar cross-section, optics, Unattended Radiated Emissions (URE), etc.) - Develop anti-armor detection and defeat capabilities: Real-time reporting from sensors on mounted vehicles that can detect road-side threats in high clutter, while operating at speed, with high Positive Detection and acceptable False Alarm Rate. - Develop real-time data processing of signal in subterranean environment to improve friendly operations in a tunnel. - Improve in-tunnel ISR and communications. - Develop explosive formulations and rapid remediation techniques for improvised threats in support of improvised threats in tunnels. - Test and develop airborne detection using thermal changes in earth or condensation anomalies presented by voids for detection of tunnels. - Improve smaller laser to support pre-detonation capabilities - Improve size, weight and power for next generation of pre-detonation systems - Improve mounted detection of buried IEDs through real-time reporting from sensors on mounted vehicles that can detect buried threats at depths while conducting maneuver ops at speed with high Positive Detection and acceptable False Alarm Rate. Hardware improvements enable faster sensing and software improvements enable faster systems-of-systems reporting (higher Positive Detection and lower False Alarm Rate). ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase from FY 2018 to FY 2019 is due to the establishment of Project JC-Enable Rapid Capability Delivery in Program Element 0604134BR / Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing in the RDT&E appropriation. This reflects the realignment of the DTRA-JIDO research and development activities in accordance with Congressional intent to terminate the Joint Improvised-Threat Defeat Fund in section 9015 of the Chairman's recommendation to the Senate Appropriations Committee for the Department of Defense Appropriations Bill, 2018 (FY 2018 Baseline: $0 million.)					
Accomplishments/Planned Programs Subtotals	0.000	0.000	12.993	221.802	234.795

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604134BR / *Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing*	**Project (Number/Name)** JC / *Enable Rapid Capability Delivery*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs. Performer base includes research developers across DoD and other Government agency laboratories, academia, and industry.

E. Performance Metrics

Percentage of completed Counter Improvised-Threat Technology demonstration programs transitioning to Warfighter each year.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604134BR / *Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing*	**Project (Number/Name)** JC / *Enable Rapid Capability Delivery*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Iris Trace	C/TBD	I2WD-COMMUNICATIONS-ELECTRONICS RESEARCH, DEVELOPMENT AND ENGINEERING CENTER (CERDEC) : Abderdeen, MD	-	-		-		1.236	Dec 2018	0.000		1.236	Continuing	Continuing	-
Iris Sanctum	TBD	Central Intelligence Agency : Fairfax, VA	-	-		-		1.751	Dec 2018	0.000		1.751	Continuing	Continuing	-
Tough Luck	C/TBD	Johns Hopkins University : Baltimore, MD	-	-		-		1.545	Dec 2018	0.000		1.545	Continuing	Continuing	-
Velvet Paper	C/TBD	Johns Hopkins University/Navy : Various	-	-		-		1.545	Dec 2018	0.000		1.545	Continuing	Continuing	-
Anti-Armor IED (AAIED)	C/TBD	TBD : TBD	-	-		-		0.000		4.000	Dec 2018	4.000	Continuing	Continuing	-
Booby Trapped Structures (BTS)	C/TBD	TBD : TBD	-	-		-		0.000		3.850	Dec 2018	3.850	Continuing	Continuing	-
Buried IED	C/TBD	TBD : TBD	-	-		-		0.000		19.750	Mar 2019	19.750	Continuing	Continuing	-
Home-Made Explosives (HME)	C/TBD	TBD : TBD	-	-		-		0.000		18.100	Dec 2018	18.100	Continuing	Continuing	-
Network	C/TBD	TBD : TBD	-	-		-		0.000		40.668	Dec 2018	40.668	Continuing	Continuing	-
Person-Born IED (PBIED)	C/TBD	TBD : TBD	-	-		-		0.000		5.000	Dec 2018	5.000	Continuing	Continuing	-
Radio Controlled IED (RCIED)	C/TBD	TBD : TBD	-	-		-		0.000		32.500	Mar 2019	32.500	Continuing	Continuing	-
Tunnel	C/TBD	TBD : TBD	-	-		-		0.000		7.000	Dec 2018	7.000	Continuing	Continuing	-
Unmanned Aerial Systems (UAS)	C/TBD	TBD : TBD	-	-		-		0.000		58.955	Mar 2019	58.955	Continuing	Continuing	-
Vehicle-Attached IED (VAIED)	C/TBD	TBD : TBD	-	-		-		0.000		1.000	Dec 2018	1.000	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604134BR / *Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing*	**Project (Number/Name)** JC / *Enable Rapid Capability Delivery*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Vehicle-Borne IED (VBIED)	C/TBD	TBD : TBD	-	-		-		0.000		19.550	Dec 2018	19.550	Continuing	Continuing	-
Water-Borne IED (WBIED)	C/TBD	TBD : TBD	-	-		-		0.000		2.000	Mar 2019	2.000	Continuing	Continuing	-
		Subtotal	-	-		-		6.077		212.373		218.450	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TAG Modeling and Simulation	C/TBD	Naval Air Weapons Station : China lake, CA	-	-		-		2.575	Dec 2018	-		2.575	Continuing	Continuing	-
Theater Support Test (JTB)	TBD	Naval Air Weapons Station : China Lake, CA	-	-		-		2.796	Dec 2018	-		2.796	Continuing	Continuing	-
Threat Devices Characterization Prototyping and Production	TBD	I2WD-COMMUNICATIONS-ELECTRONICS RESEARCH, DEVELOPMENT AND ENGINEERING CENTER (CERDEC) : Abderdeen, MD	-	-		-		1.545	Dec 2018	-		1.545	Continuing	Continuing	-
Rapid Experimentation and Analysis for Development Support (READS)	C/TBD	TBD : TBD	-	-		-		0.000		2.060	Mar 2019	2.060	Continuing	Continuing	-
Joint Test Board	TBD	TBD : TBD	-	-		-		0.000		5.074	Dec 2018	5.074	Continuing	Continuing	-
OC25	C/TBD	TBD : TBD	-	-		-		0.000		0.235	Dec 2018	0.235	Continuing	Continuing	-
Tech Exploitation	C/TBD	TBD : TBD	-	-		-		0.000		2.060	Mar 2019	2.060	Continuing	Continuing	-
		Subtotal	-	-		-		6.916		9.429		16.345	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604134BR / *Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing*	Project (Number/Name) JC / *Enable Rapid Capability Delivery*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		12.993		221.802		234.795	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604134BR / *Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing*	**Project (Number/Name)** JC / *Enable Rapid Capability Delivery*

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
N/A									[redacted]																			

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604134BR / *Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing*	**Project (Number/Name)** JC / *Enable Rapid Capability Delivery*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
N/A	1	2019	4	2019

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Defense Threat Reduction Agency	Date: February 2018
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605000BR / **Counter Weapons of Mass Destruction Systems Development*

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	20.690	4.479	6.241	6.163	-	6.163	4.821	5.340	5.602	5.720	Continuing	Continuing
RF: *Forensics Technologies*	20.690	4.479	6.241	6.163	-	6.163	4.821	5.340	5.602	5.720	Continuing	Continuing

Note

*Program Element 0605000BR name changes from WMD Defeat Capabilities to Counter Weapons of Mass Destruction Systems Development beginning in FY 2018.
**Project RF-Detection and Forensics Technologies subdivides into Projects RD-Detection Technologies and RF-Forensics Technologies in FY 2016. This impacts these projects in PE 0602718BR and PE 0603160BR. See C. Other Program Funding Summary below.

A. Mission Description and Budget Item Justification

The Counter Weapons of Mass Destruction (WMD) Systems Development program element supports the development and demonstration of verification and monitoring technologies and systems for the Countering Weapons of Mass Destruction (CWMD) mission. This funding specifically supports International Monitoring System technology requirements under the Nuclear Arms Control Technology (NACT) program. Through FY 2014, funding also supported the development of collaborative CWMD analysis capabilities between the Department of Defense and key interagency and international partners through a globally accessible net-centric framework in the form of the Integrated Weapons of Mass Destruction Toolset.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	4.568	6.241	6.216	-	6.216
Current President's Budget	4.479	6.241	6.163	-	6.163
Total Adjustments	-0.089	0.000	-0.053	-	-0.053
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.089	-			
• Economic Assumptions	-	-	-0.053	-	-0.053

Change Summary Explanation

The funding level in this program element continues to reflect the impact of incremental Service Requirement Review Board reductions, as part of the Department of Defense reform agenda, for consolidation and reduction of service contracts.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605000BR / *Counter Weapons of Mass Destruction Systems Development	Project (Number/Name) RF / Forensics Technologies	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RF: *Forensics Technologies*	20.690	4.479	6.241	6.163	-	6.163	4.821	5.340	5.602	5.720	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports the development of verification and monitoring capabilities for the Defense Threat Reduction Agency (DTRA) to counter proliferation and weapons of mass destruction (WMD). DTRA's Nuclear Arms Control Technologies (NACT) program performs Research, Development, Test, and Evaluation (RDT&E) to improve the sustainability, reliability, and effectiveness of capabilities related to its operational mission to install, operate, maintain, and sustain the waveform and radionuclide nuclear detonation detection stations comprising the U.S. portion of the International Monitoring System (IMS). This delivers data to the U.S. monitoring and verification community and enables U.S. compliance with the Comprehensive Nuclear Test Ban Treaty (CTBT) in support of U.S. and Department of Defense (DoD) nonproliferation objectives.

The project addresses WMD monitoring, implementation of, and compliance with arms control agreement requirements validated by the Office of the Under Secretary of Defense, Acquisition, Technology, and Logistics. This project conforms to the administration's research and development priorities related to WMD arms control and disablement. Technical assessments are made against CTBT implementation requirements and U.S. objectives to provide the basis for sound project development, evaluate existing programs, provide data required to inform compliance assessments, and support U.S. monitoring policy, decision-makers, and negotiation teams.

The primary RDT&E program emphasis is on improvements that enable the installation of treaty-specific stations, which reduce costs and increase the reliability in diverse and often harsh environments; improve efficiency, performance, reliability, and sustainability of existing stations and treaty-specified verification capabilities; and improve capabilities to detect, characterize, and enable discrimination of, nuclear weapons tests. The NACT program directly supports U.S. and allied warfighter and national technical monitoring requirements and provides vital data used by the treaty monitoring community, warfighter planners, DoD, other U.S. Government agencies, and international agencies.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: RF - Forensics Technologies	4.479	6.241	6.163
Description: Project RF supports the NACT Program, conducting RDT&E to meet IMS technology requirements in support of CTBT implementation, compliance, monitoring, inspection, and other emerging nuclear arms control activities.			
FY 2018 Plans: - Continue the optimization of IMS technology and operations to comply with CTBT language and evolving operational manual requirements in order to increase efficiencies, sustainability and cost effectiveness. - Conduct testing and evaluation of waveform station components and systems at the Facility for Acceptance, Calibration, and Testing site as a demonstration in a relevant environment.			

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605000BR / **Counter Weapons of Mass Destruction Systems Development*	**Project (Number/Name)** RF / *Forensics Technologies*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
- Continue development of improved state of health monitoring software for use on radionuclide stations to provide a predictive indication of pending failures and required maintenance. - Establish a Radionuclide Test-bed capability for rapid resolution of system faults. - Participate in international/interagency- sponsored technology development exchanges to leverage expertise and to provide synergy for R&D activities. - Continue to conduct field testing on High Reliability Power Sources for arctic operational environments. - Conduct Entry-into-Force Readiness, Rapid Response risk assessment tools, and conduct Operational Tabletop Exercises in order to quantify operational risks and the costs of mitigation costs. - Advance the “state of health” performance monitoring capabilities for waveform and radionuclide stations to increase reliability, sustainability, and cost effectiveness. - Evaluate infrasound sensors for use at IMS stations - Evaluate the implementation of a standard configuration for the Central Recording Facility for use at IMS stations - Continue the sustainment of the Radionuclide Lab (RL16) at Pacific Northwest National Laboratory in support of the CTBT. ***FY 2019 Plans:*** - Implement use of IMS infrastructure to provide data in support DoD and iInteragency nuclear-event response missions in order to enhance National Technical Nuclear Forensics (NTNF) and consequence management mission capabilities. - Integrate IMS into appropriate DoD and interagency exercises to ensure stakeholder involvement in system optimization and to leverage, to the fullest extent possible, all IMS data streams in informing partner exercise activities. - Analyze technical requirements for the addition of capabilities within the IMS infrastructure that will support nuclear-event response. - Advance nuclear treaty monitoring capabilities to higher technology readiness levels to establish a resilient, multi-mission, and state-of-the-art IMS capability. - Leverage conventional high-explosive testing events in order to increase opportunities to evaluate U.S. IMS performance. - Participate in CTBT Organization Provisional Technical Secretariat international/interagency- sponsored technology development exchanges to leverage expertise and to provide synergy for R&D activities. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change.			
Accomplishments/Planned Programs Subtotals	4.479	6.241	6.163

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605000BR / **Counter Weapons of Mass Destruction Systems Development*	**Project (Number/Name)** RF / *Forensics Technologies*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 20/0602718BR: *Counter Weapons of Mass Destruction Applied Research*	9.176	10.274	10.257	-	10.257	10.466	10.675	10.894	11.123	Continuing	Continuing
• 27/0603160BR: *Counter Weapons of Mass Destruction Advanced Technology Development*	36.738	40.286	33.578	-	33.578	32.973	33.668	34.371	35.094	Continuing	Continuing

Remarks

D. Acquisition Strategy

Assess government, academic, and industrial performers and make selections based upon a "best fit for task" criteria. Common government awardees include DoD Service Laboratories and the Department of Energy National Laboratories.

E. Performance Metrics

The goal of the NACT RDT&E program is to enable full compliance of all emerging data availability/data quality requirements and other operational requirements as documented in nuclear CTBT treaty requirements, nuclear-event response requirements, language, CTBT-issued Radionuclide and Waveform Operations Manuals, other CTBT Organization communications, and DoD Treaty Implementation Manager directives. The IMS data availability/timeliness performance specifications are currently 98% data availability for IMS waveform and 95% for IMS radionuclide systems. The data quality specifications are various data metrics that allow accurate time, location, and yield estimation of a nuclear event. RDT&E is conducted in support of the NACT's operational mission to operate, maintain, and sustain the Provisional Technical Secretariat certified waveform and radionuclide CTBT IMS monitoring stations and radionuclide laboratory in accordance with CTBT requirements at the lowest cost. CTBT IMS data availability/timeliness performance specifications are currently 98% data availability for IMS waveform and 95% for IMS radionuclide systems. Data quality metrics continue to evolve as the entire CTBT IMS capability is exercised and tested.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605000BR / *Counter Weapons of Mass Destruction Systems Development*	**Project (Number/Name)** RF / *Forensics Technologies*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Radionuclide sensor, station, laboratory and network improvements	FFRDC	Pacific Northwest National Laboratory : Richland, WA	5.118	0.833	Feb 2017	1.575	Jan 2018	1.550	Jan 2019	-		1.550	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements; validation and verification testing	FFRDC	Sandia National Laboratory : Albuquerque, NM	4.660	0.934	Jan 2017	1.550	Jan 2018	1.850	Jan 2019	-		1.850	Continuing	Continuing	-
Radionuclide sensor, station, and network improvements	MIPR	Air Force Technical Application Center : Patrick AFB, FL	2.400	0.230	Nov 2016	0.370	Nov 2017	0.250	Nov 2018	-		0.250	Continuing	Continuing	-
Engineering & Technical Services	C/CPFF	Engility Corp : Chantilly, VA	1.986	-		-		-		-		-	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements	C/CPFF	Dynetics, Inc : Arlington, VA	1.828	-		-		-		-		-	Continuing	Continuing	-
Radionuclide sensor, station, laboratory and network improvements	C/CPFF	General Dynamics Misson Systems, Inc. : Fairfax, VA	1.446	0.602	Sep 2017	0.460	Dec 2017	0.431	Nov 2018	-		0.431	Continuing	Continuing	-
Station, and network Improvements	C/CPFF	Leidos Innovations Corp. : Alexandria, VA	0.374	0.092	Dec 2016	0.300	Apr 2018	0.200	Apr 2019	-		0.200	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements	C/CPFF	Pennsylvania State University : State College, PA	0.322	0.480	May 2017	0.332	Jan 2018	0.200	Jan 2019	-		0.200	Continuing	Continuing	-
Station failure and logistics modeling and simulation	C/CPFF	Systems Exchange, Inc. : Carmel, CA	0.235	0.039	Jul 2017	0.039	Jul 2018	-		-		-	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements	MIPR	Naval Research Laboratory : Washington DC	0.204	-		-		0.200	Jan 2019	-		0.200	Continuing	Continuing	-
EIF Readiness Planning	C/CPFF	Alion Science and Technology Corp. : McLean, VA	0.200	0.100	Sep 2017	-		0.100	Jan 2019	-		0.100	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605000BR / *Counter Weapons of Mass Destruction Systems Development*	**Project (Number/Name)** RF / *Forensics Technologies*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Radionuclide sensor, station, laboratory and network improvements	C/CPFF	Raytheon Company : Dulles, VA	0.200	-		-		-		-		-	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements	C/CPFF	University of Alaska Fairbanks : Fairbanks, AK	0.190	0.140	Mar 2017	0.129	Mar 2018	0.129	Mar 2019	-		0.129	Continuing	Continuing	-
IMEA Software Development	C/CPFF	Applied Research Associates, Inc. : Alexandria, VA	-	-		0.200	Dec 2017	0.200	Dec 2018	-		0.200	Continuing	Continuing	-
IMS Gas Background Analysis	FFRDC	Argonne National Laboratory : Argonne, IL	-	-		0.130	Apr 2018	0.100	Apr 2019	-		0.100	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements; validation and verification testing	C/TBD	TBD : TBD	-	-		0.398	May 2018	0.295	May 2019	-		0.295	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements	MIPR	US Army Corps of Engineers : Vicksburg, MS	-	0.032	Aug 2017	0.200	Mar 2018	0.100	Dec 2018	-		0.100	Continuing	Continuing	-
		Subtotal	19.163	3.482		5.683		5.605		-		5.605	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS Support to Program Office	C/CPFF	Engility Corp. : Chantilly, VA	0.600	0.426	Dec 2016	0.446	Dec 2017	0.446	Dec 2018	-		0.446	Continuing	Continuing	-
A&AS Support to Program Office	MIPR	OUSD AT&L : Arlington, VA	0.470	0.478	Jul 2017	-		-		-		-	Continuing	Continuing	-
Travel	Reqn	Various : Ft. Belvoir, VA	0.457	0.093	Nov 2016	0.112	Nov 2017	0.112	Nov 2018	-		0.112	Continuing	Continuing	-
		Subtotal	1.527	0.997		0.558		0.558		-		0.558	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605000BR / **Counter Weapons of Mass Destruction Systems Development*	**Project (Number/Name)** RF / *Forensics Technologies*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	20.690	4.479		6.241		6.163		-		6.163	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605000BR / **Counter Weapons of Mass Destruction Systems Development*	**Project (Number/Name)** RF / *Forensics Technologies*

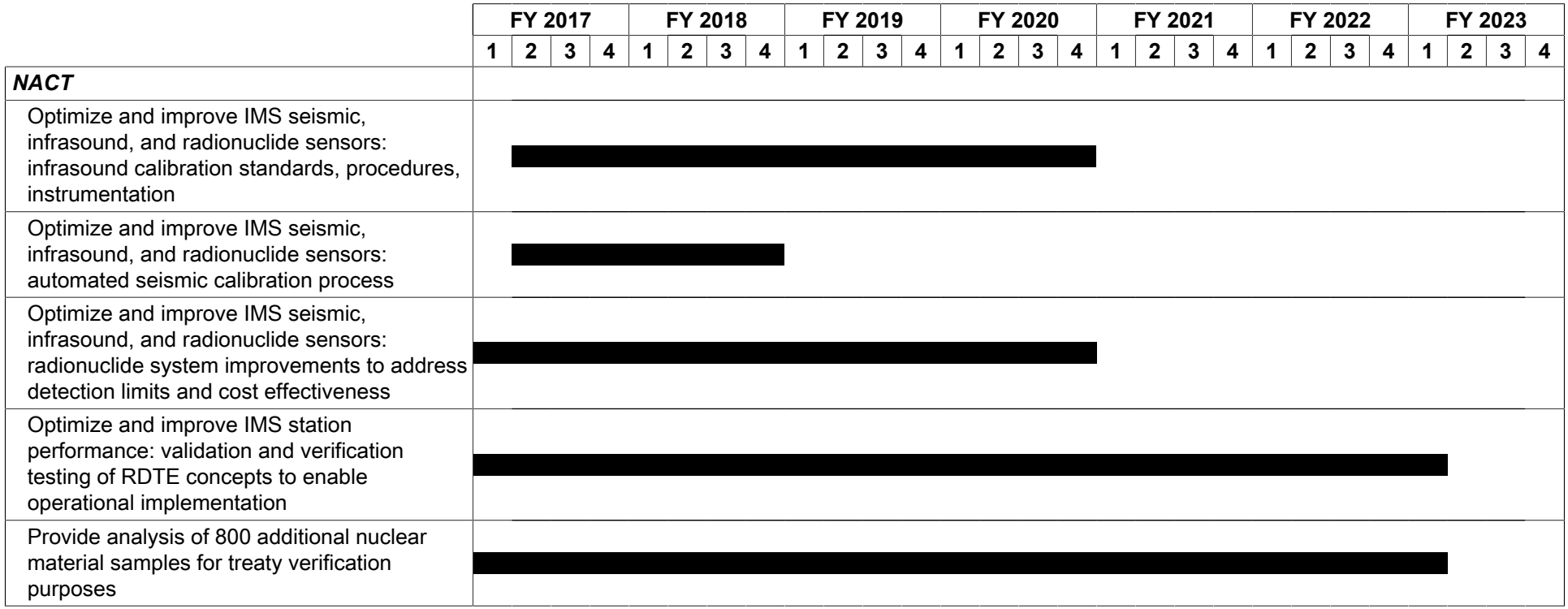

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0605000BR / **Counter Weapons of Mass Destruction Systems Development*	**Project (Number/Name)** RF / *Forensics Technologies*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
NACT				
Optimize and improve IMS seismic, infrasound, and radionuclide sensors: infrasound calibration standards, procedures, instrumentation	2	2017	4	2020
Optimize and improve IMS seismic, infrasound, and radionuclide sensors: automated seismic calibration process	2	2017	4	2018
Optimize and improve IMS seismic, infrasound, and radionuclide sensors: radionuclide system improvements to address detection limits and cost effectiveness	1	2017	4	2020
Optimize and improve IMS station performance: validation and verification testing of RDTE concepts to enable operational implementation	1	2017	1	2023
Provide analysis of 800 additional nuclear material samples for treaty verification purposes	1	2017	1	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Defense Threat Reduction Agency	Date: February 2018
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 6: *RDT&E Management Support*	**R-1 Program Element (Number/Name)** PE 0605502BR / *Small Business Innovation Research*

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	49.085	10.456	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
RA: *Information Sciences and Applications*	49.085	10.456	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

Funding for this program element is not allocated until the year of execution. Program Element 0605502BR “Small Business Innovative Research” is used in reporting year-end actual expenses only.

A. Mission Description and Budget Item Justification

The Small Business Innovative Research (SBIR) and the Small Business Technology Transfer (STTR) programs provide the means for stimulating technological innovation in the private sector, strengthens the role of small business in meeting the Department of Defense (DoD) research and development needs; fosters and encourages participation of minority and disadvantaged businesses in technological innovation; and increases the commercial application of the DoD supported research and development results. These efforts are responsive to Public Law 106-554.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	10.456	0.000	0.000	-	0.000
Total Adjustments	10.456	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	10.456	-			

Change Summary Explanation

Funding for the SBIR Program is consolidated in this Program Element during the year of execution.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605502BR / *Small Business Innovation Research*	Project (Number/Name) RA / *Information Sciences and Applications*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RA: *Information Sciences and Applications*	49.085	10.456	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

*Funding is not allocated until the year of execution. Program Element 0605502BR "Small Business Innovative Research (SBIR)" is used in reporting year-end actual expenses only.

A. Mission Description and Budget Item Justification

The Small Business Innovative Research (SBIR) and the Small Business Technology Transfer (STTR) programs provide the means for stimulating technological innovation in the private sector and strengthens the role of small business in meeting the Department of Defense (DoD) research and development needs. These programs foster and encourage participation of minority and disadvantaged businesses in technological innovation and increase the commercial application of DoD supported research and development results. These efforts are responsive to Public Law 106-554 Small Business Act (15 U.S.C. 638).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018	FY 2019
Title: RA: Information Sciences and Applications	10.456	-	-
Description: This project provides the means for stimulating technological innovation in the private sector, strengthens the role of small business in meeting the DoD research and development needs; fosters and encourages participation of minority and disadvantaged businesses in technological innovation; and increases the commercial application of the DoD supported research and development results. These efforts are responsive to Public Law 106-554.			
Accomplishments/Planned Programs Subtotals	10.456	-	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 20/0602718BR: *Counter Weapons of Mass Destruction Applied Research*	35.048	30.270	31.830	-	31.830	29.977	30.167	30.412	31.270	Continuing	Continuing
• 27/0603160BR: *Counter Weapons of Mass Destruction Advanced Technology Development*	18.102	10.229	11.286	-	11.286	11.480	11.742	12.005	12.258	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2019 Defense Threat Reduction Agency		Date: February 2018
Appropriation/Budget Activity 0400 / 6	**R-1 Program Element (Number/Name)** PE 0605502BR / *Small Business Innovation Research*	**Project (Number/Name)** RA / *Information Sciences and Applications*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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