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 I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603160BR *I *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.")