Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Defense Threat Reduction Agency											Date: February 2020	
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 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**Cost To Complete**	**Total Cost**
Total Program Element	1,255.600	150.040	174.096	174.571	0.000	174.571	174.915	177.995	185.192	188.975	Continuing	Continuing
RA: *CWMD Cross-Cutting Technical and Information Sciences*	264.657	36.665	44.167	40.965	0.000	40.965	42.194	42.773	47.564	48.593	Continuing	Continuing
RD: *Nuclear Technologies and Capabilities Development*	43.398	21.050	89.860	92.492	0.000	92.492	91.351	93.732	95.307	97.214	Continuing	Continuing
RE: *Counter Terrorism Technologies*	0.693	0.850	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.543
RF: *Forensics Technologies*	223.112	7.716	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	230.828
RG: *Counter WMD Technologies and Capabilities Development*	105.632	7.938	22.253	22.958	0.000	22.958	22.919	23.715	24.190	24.675	Continuing	Continuing
RI: *Nuclear Survivability*	184.812	22.632	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	207.444
RL: *Nuclear & Radiological Effects*	215.561	27.643	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	243.204
RM: *WMD Counterforce Technologies*	118.311	11.342	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	129.653
RR: *CWMD Test and Evaluation*	99.424	14.204	17.816	18.156	0.000	18.156	18.451	17.775	18.131	18.493	Continuing	Continuing

Note

In FY 2020, the Defense Threat Reduction Agency (DTRA) consolidated projects RF-Forensics Technologies, RI-Nuclear Survivability, and RL-Nuclear and Radiological Effects into the renamed project RD-Nuclear Technologies and Capabilities Development. Additionally, DTRA consolidated RM-Weapons of Mass Destruction (WMD) Counterforce Technologies into the renamed project RG-Counter WMD Technologies and Capabilities Development. There is no change to the program element or project structure in the FY 2021 request.

A. Mission Description and Budget Item Justification

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

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Defense Threat Reduction Agency	Date: February 2020
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 2: *Applied Research*	**R-1 Program Element (Number/Name)** PE 0602718BR *I Counter Weapons of Mass Destruction Applied Research*

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

The portfolio advances DTRA's CWMD mission by balancing the following: 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 the 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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	155.924	179.096	182.758	-	182.758
Current President's Budget	150.040	174.096	174.571	-	174.571
Total Adjustments	-5.884	-5.000	-8.187	-	-8.187
• Congressional General Reductions	-	-5.000			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-2.244	-			
• SBIR/STTR Transfer	-3.640	-			
• Realignments	-	-	-8.187	-	-8.187

Change Summary Explanation

The Congressional reduction in FY 2020 is for unjustified growth. The decrease in FY 2021 from the previous President's Budget submission is due to the net impact of:
(1) the realignment of funds to PE 0603160BR for the CWMD Information Integration Cell (CIIC) to better reflect the nature of this activity,
(2) increased investment in nuclear weapons effects targeting, battlefield nuclear warfare, certification without underground testing,
(3) realignment of funds from PE 0602718BR to 0603160BR for full effects modeling and WMD survivability and consequence management, and
(4) increased investment in WMD counterforce activities to conduct testing of advanced diagnostics with Defence Research and Development Canada as part of a Coalition Warfare Program to advance CWMD planning tools.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency			Date: February 2020
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research*	Project (Number/Name) RA / *CWMD Cross-Cutting Technical and Information Sciences*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
RA: *CWMD Cross-Cutting Technical and Information Sciences*	264.657	36.665	44.167	40.965	0.000	40.965	42.194	42.773	47.564	48.593	Continuing	Continuing

A. Mission Description and Budget Item Justification

The CWMD Cross-Cutting Technical and Information Sciences 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 reach-back teams. This project develops and maintains continuously improving collaborative architectures and Weapons of Mass Destruction (WMD) 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 WMD (CWMD) partners. This effort also funds research activities that benefit the public through analysis and engagement to reduce and counter threats posed by WMD via the Project on Advanced Systems and Concepts for Countering WMD (PASCC). PASCC cultivates national and international research community partnerships across domains, bringing scientific, technical, and social science experts together to help understand and anticipate WMD capabilities and threats.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: RA: CWMD Cross-Cutting Technical and Information Sciences	36.665	44.167	40.965	0.000	40.965
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 2020 Plans:*** - Support select NATO nations' access to a shared WMD and explosives modeling capability as requested by individual nations through the Partnership of Cooperation agreements. - Enhance Force-on-Force Evaluation and Analysis of Key Performance Parameters (FREAK) cloud architecture to increase availability of chemical/biological personnel casualty and detector models that support Course of Action Analysis, Concept of Operations Development, and Sensor Performance Prediction. - Provide software releases to include DoD customer detector requests for Virtual Radiation Training through Ubiety System (VIRTUS), which provides a mobile phone-based radiation sensor emulator for search training. - Provide increased stand-alone modeling capability for Android Tactical Assault Kit (ATAK), which incorporates CWMD capabilities into a mobile phone-based tactical common operating picture, to support new, emerging and updated modeling and simulation requirements.					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency		Date: February 2020
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research*	**Project (Number/Name)** RA / *CWMD Cross-Cutting Technical and Information Sciences*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Transition the Enhanced Mapping and Positioning System (EMAPS) to the Joint Program Executive Office, Chemical and Biological Defense. This system uses Light, Detection and Ranging (LIDAR) to automatically create real-time 2D/3D annotated physical maps of areas denied to the Global Positioning System. ***FY 2021 Base Plans:*** - Support select NATO nations' access to a shared WMD and explosives modeling capability as requested by individual nations through the Partnership of Cooperation agreements. - Enhance FREAK cloud architecture to increase availability of chemical/biological personnel casualty and detector models that support Course of Action Analysis, Concept of Operations Development, and Sensor Performance Prediction. - Provide software releases to include DoD customer detector requests for VIRTUS, which provides a mobile phone-based radiation sensor emulator for search training. - Provide stand-alone modeling capability for ATAK, which incorporates CWMD capabilities into a mobile phone-based tactical common operating picture, to support new, emerging and updated modeling and simulation requirements. - Provide quarterly updates to forecasted changes/developments in geopolitical landscapes and the intersection of Chemical, Biological, Radiological, and Nuclear (CBRN) and WMD employment systems. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The decrease from FY 2020 to FY 2021 reflects the net effect of the realignment of funds from this program element to program element 0603160BR for the CWMD Information Integration Cell (CIIC) to better reflect the nature of this activity.					
Accomplishments/Planned Programs Subtotals	36.665	44.167	40.965	0.000	40.965

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• 29/0603160BR/RA: *Counter Weapons of Mass Destruction Advanced Technology Development*	18.080	34.825	50.019	-	50.019	46.279	49.207	50.708	51.721	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency		Date: February 2020
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research*	**Project (Number/Name)** RA / *CWMD Cross-Cutting Technical and Information Sciences*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• 162/0605502BR/RA: *Small Business Innovation Research*	11.315	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	11.315

Remarks

D. Acquisition Strategy

Competitive selection of most appropriate performers to fulfill science and technology development needs.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency											Date: February 2020	
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research*				Project (Number/Name) RD / *Nuclear Technologies and Capabilities Development*			
COST ($ in Millions)	**Prior Years**	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**Cost To Complete**	**Total Cost**
RD: *Nuclear Technologies and Capabilities Development*	43.398	21.050	89.860	92.492	0.000	92.492	91.351	93.732	95.307	97.214	Continuing	Continuing

Note

In FY 2020, DTRA consolidated projects RF-Forensics Technologies, RI-Nuclear Survivability, and RL-Nuclear and Radiological Effects in program element 0602718BR, into the renamed project RD-Nuclear Technologies and Capabilities Development.

A. Mission Description and Budget Item Justification

Nuclear Technologies and Capabilities Development encompasses the following related areas:

1. Research, development, test, and evaluation (RDT&E) to identify, develop, and exploit signatures associated with nuclear threats in support of U.S. capabilities that detect and interdict such threats; and 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, counterproliferation, nonproliferation, countering rogue states, and homeland defense.

2. RDT&E to systematically study signatures associated with adversary nuclear programs and nuclear detonations to gain knowledge or understanding necessary to: determine technical capabilities needed to improve DoD contingency planning activities; improve DoD situational awareness on the nuclear battlefield; and improve capabilities to attribute the source of a nuclear detonation.

3. Research and develop 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 DoD Instruction 3150.09, Chemical, Biological, Radiological, and Nuclear Survivability Policy. System vulnerability research 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. Experimental capabilities research provides the warfighter with unique x-ray, gamma ray, and electromagnetic pulse (EMP) test capabilities in support of system survivability development, certification, and sustainment. 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.

4. Research and development modeling tools to support military operational planning, weapons effects predictions, and strategic system design decisions; consolidate validated modeling tools 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.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency		Date: February 2020
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research*	**Project (Number/Name)** RD / *Nuclear Technologies and Capabilities Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: RD: Nuclear Technologies and Capabilities Development	21.050	89.860	92.492	0.000	92.492
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 2020 Plans:*** - Enhance contamination avoidance capabilities. - Contribute to the development of an American National Standards Institute (ANSI) standard to assess DoD radiation imager's performance and evaluation. - Develop and test new application-specific integrated circuits (ASIC) to improve radiation detector performance while also reducing power requirements. - Test and evaluate a proof of principle Virtual Reality/Augmented Reality (VR/AR) testbed for use in evaluating radiation detection equipment. - Actualize 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. - 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. - Integrate sensor platforms and layering of additional data sets to enhance detection of nuclear targets of interest. Enhance and expand capabilities to identify nuclear targets of interest in overhead imagery using next-generation computer-vision techniques, in order to enable follow-on actions - Improve DoD decision-making by gaining knowledge to determine how to adapt nuclear sensor capabilities to quickly characterize nuclear explosions on the nuclear battlefield and inform tactical, operational, and strategic military actions. - Systematically study techniques to improve the ability of nuclear modeling codes to support tactical DoD operations. - 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. - Conduct research on improved nuclear battlefield casualty assessment and medical planning for nuclear/ radiological events.					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency		Date: February 2020
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research*	**Project (Number/Name)** RD / *Nuclear Technologies and Capabilities Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- 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. - Develop petroleum effects models for nuclear targeting capabilities linking higher order impacts to Political Military Economic Social Infrastructure Information (PMESII) analyses. By 4th QTR FY21, develop software prototype capable of injecting nuclear effects, and integrate into select models supporting CCMD and Service wargames. - Develop low-cost, mobile and autonomous wide area and point search detectors to enable the warfighter to characterize, map, and avoid radiation hazards on the nuclear battlefield. - Improve support to a robust nuclear deterrent without resumption of underground nuclear testing by providing modernized survivability standards, toolkits and test and evaluation (T&E) data for legacy and new mission critical nuclear, conventional, satellite and missile defense systems. - Deliver integrated, cloud-ready, cross-cutting platform, applications, and data analysis AI-enhanced capabilities to support the full spectrum of nuclear operations, war gaming, and assessments. - Develop wearable neutron detectors made of Boron-Coated Straw in support of the development of modern, novel detector solutions to revolutionize concept of operations (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. - Develop petroleum effects models for nuclear targeting capabilities linking higher order impacts to Political Military Economic Social Infrastructure Information (PMESII) analyses. - Conduct research on improved nuclear battlefield casualty assessment and medical planning for nuclear/ radiological events. - 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.					
FY 2021 Base Plans: - Enhance existing contamination avoidance capabilities. - Develop an additional new radiation signature test device (RSTD) to expand test capabilities and detector evaluation. - Evaluate the performance of novel materials (e.g. CLLBC (Cs2LiLa(Br,Cl)6:Ce, Dual-sided micro-structured semiconductor neutron detectors (DSMSNDs)) as a replacement for both high energy resolution gamma-ray detectors and high pressure Helium- neutron detectors.					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency		Date: February 2020
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research*	**Project (Number/Name)** RD / *Nuclear Technologies and Capabilities Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Further 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. - Generate additional 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. - Support transitioning those technologies that demonstrate exceptional capabilities in radiation and nuclear threat detection to advanced technology development. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The increase from FY 2020 to FY 2021 is due to the net impact of: (1) increased investment in nuclear weapons effects targeting, battlefield nuclear warfare, certification without underground testing, and (2) realignment of funds from PE 0602718BR to 0603160BR for full effects modeling and WMD survivability and consequence management.					
Accomplishments/Planned Programs Subtotals	21.050	89.860	92.492	0.000	92.492

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• 29/0603160BR/RD: *Counter Weapons of Mass Destruction Advanced Technology Development*	21.193	70.153	51.416	-	51.416	51.480	53.081	55.547	56.659	Continuing	Continuing
• 128/0605000BR/RD: *Counter Weapons of Mass Destruction Systems Development*	-	7.500	15.650	-	15.650	14.803	13.959	13.118	13.381	Continuing	Continuing

Remarks

D. Acquisition Strategy

Competitive selection of most appropriate performers to fulfill science and technology development needs.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency			Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
RE: *Counter Terrorism Technologies*	0.693	0.850	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.543

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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: RE: Counter-Terrorism Technologies	0.850	-	-	-	-
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	0.850	-	-	-	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• 29/0603160BR/RE: *Counter-Terrorism Technologies*	108.964	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	108.964

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency			Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
RF: *Forensics Technologies*	223.112	7.716	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	230.828

Note

Beginning in FY 2020, efforts in this project are captured under project RD-Nuclear Technologies and Capabilities Development.

A. Mission Description and Budget Item Justification

The Forensics Technologies project develops 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's (DTRA) and its 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 National Technical Nuclear Forensics (NTNF) research and development. As the central NTNF coordinator, DTRA works in consultation with partners to develop and improve ground-based capabilities supporting exploitation and attribution missions.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: RF: Forensics Technologies	7.716	0.000	0.000	0.000	0.000
Description: Project RF develops 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 2020 Plans:*** N/A ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** N/A					
Accomplishments/Planned Programs Subtotals	7.716	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency		Date: February 2020
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*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• 29/0603160BR/RF: *Counter Weapons of Mass Destruction Advanced Technology Development*	30.947	-	-	-	-	-	-	-	-	0.000	30.947
• 128/0605000BR/RF: *Counter Weapons of Mass Destruction Systems Development*	6.016	-	-	-	-	-	-	-	-	0.000	6.016

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 2021 Defense Threat Reduction Agency			Date: February 2020
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research*	Project (Number/Name) RG / *Counter WMD Technologies and Capabilities Development*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
RG: *Counter WMD Technologies and Capabilities Development*	105.632	7.938	22.253	22.958	0.000	22.958	22.919	23.715	24.190	24.675	Continuing	Continuing

Note

In FY 2020, DTRA consolidated RM-Weapons of Mass Destruction (WMD) Counterforce Technologies into RG-Counter WMD Technologies and Capabilities Development.

A. Mission Description and Budget Item Justification

Counter WMD Technologies and Capabilities Development encompasses the following areas.

1. Defeat Technologies 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. 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 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 Budget Activity (BA) 3, Advanced Technology Development (ATD) efforts. On a limited basis, technology test data is shared with coalition partners.

2. WMD counterforce technologies research develops weapons 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 Technical Reachback cell. These activities are critical enablers for the development of advanced CWMD planning tools. Energetics research develops materials and weapon design technology providing defeat capabilities for engaging hard and deeply buried targets that are beyond current high explosive blast/fragmentation warhead technology.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: RG: Counter WMD Technologies and Capabilities Development	7.938	22.253	22.958	0.000	22.958
Description: Project RG develops innovative kinetic and non-kinetic weapons 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 2020 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency		Date: February 2020
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research*	**Project (Number/Name)** RG / *Counter WMD Technologies and Capabilities Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Conduct incremental capability demonstrations for advanced technology systems. - Initiate development of novel, air delivered, incendiary weapon fills for agent defeat. - Develop future advanced holistic payloads, specifically for hard and deeply buried targets. - Provide infrastructure to collect signatures including sensors, lab and field equipment, collection software, and collection tools. - Develop 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. - Develop and test structural reactive materials and advanced thermal agent defeat devices to improve the capability to defeat and/or neutralize CWMD-related targets. - Test biocide at a 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 2021 Base Plans: - Develop offensive counter-proliferation, counter-WMD technologies in support of Combatant Command requirements. - Develop WMD pathway defeat technologies, as well as threat-specific test articles and analyses. - Develop lighter, smaller, more effective breaching capabilities. - Develop next generation WMD detection technology applications. - Develop advanced data analytics and technical capabilities to rapidly capture, catalogue and illuminate nefarious activities to counter improvised threat networks and provide WMD situational awareness. - Build analytic capabilities that enhance the Fusion Analysis Development Effort (FADE)/Multi- Intelligence Spatial Temporal (MIST) tool suite for geospatial predictive analytics, and pattern of life and anomaly detection. This fusion of sources provides a central, tailorable asset for CWMD mission planning, mission execution, and supports CONPLAN 7599 for identifying and assessing threats. - Deliver mobile phone-based tactical common operating picture to U.S. Forces, to support new, emerging and updated modeling and simulation requirements. - Conduct biocide testing at larger scale to analyze prompt and persistent effects, improving capability to neutralize or destroy biological weapons or agents. - Develop environmental monitors for identification and characterization of CBRN production.					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency		Date: February 2020
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research*	**Project (Number/Name)** RG / *Counter WMD Technologies and Capabilities Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Develop CWMD weapon effects modeling algorithms and scaled test series for attack planning to investigate CWMD weapon effects enhance WMD defeat modeling and simulation planning tools and assess new WMD defeat mechanisms. - Conduct small scale testing of structural reactive materials and advanced thermal agent defeat devices to improve the capability to defeat and/or neutralize CWMD-related targets. - Conduct biocide testing at larger scales to analyze prompt and persistent effects, improving capability to neutralize or destroy biological weapons or agents. - Research and investment in application of basic and applied research initiatives and support test and evaluation of emerging autonomous technologies to support future and emerging threat requirements. - Develop offensive counter-proliferation, counter-WMD technologies in support of combatant command requirements. - Develop WMD pathway defeat technologies, as well as threat-specific test articles and analyses. - Initiate studies on novel next generation agent defeat warhead fills and design. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The increase from FY 2020 to FY 2021 is due to increased investment in WMD counterforce activities to conduct testing of advanced diagnostics with Defence Research and Development Canada as part of a Coalition Warfare Program to advance CWMD planning tools.					
Accomplishments/Planned Programs Subtotals	7.938	22.253	22.958	0.000	22.958

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• 29/0603160BR/RG: *Counter Weapons of Mass Destruction Advanced Technology Development*	22.354	225.087	265.224	0.000	265.224	242.425	246.630	250.582	255.592	Continuing	Continuing

Remarks

D. Acquisition Strategy

Competitive selection of most appropriate performers to fulfill science and technology development needs.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency			Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
RI: *Nuclear Survivability*	184.812	22.632	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	207.444

Note

Beginning in FY 2020, efforts in this project are captured under project RD-Nuclear Technologies and Capabilities Development.

A. Mission Description and Budget Item Justification

Efforts in this project include system vulnerability assessment, experimental capabilities, nuclear technology analysis, and human survivability.

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. 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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: RI: Nuclear Survivability	22.632	0.000	0.000	0.000	0.000
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 2020 Plans: N/A					
FY 2021 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency		Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** N/A					
Accomplishments/Planned Programs Subtotals	22.632	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• 29/0603160BR/RI: *Counter Weapons of Mass Destruction Advanced Technology Development*	8.583	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.583

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 2021 Defense Threat Reduction Agency			Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
RL: *Nuclear & Radiological Effects*	215.561	27.643	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	243.204

Note

Beginning in FY 2020, efforts in this project are captured under project RD-Nuclear Technologies and Capabilities Development.

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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: RL: Nuclear & Radiological Effects	27.643	0.000	0.000	0.000	0.000
Description: Project RL delivers nuclear weapons effects applications that enable effective targeting of U.S. nuclear weapons, and inform protection and response against adversary nuclear attacks.					
FY 2020 Plans: N/A					
FY 2021 Base Plans: N/A					
FY 2021 OCO Plans: N/A					
FY 2020 to FY 2021 Increase/Decrease Statement: N/A					
Accomplishments/Planned Programs Subtotals	27.643	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency		Date: February 2020
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*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• 29/0603160BR/RL: *Counter Weapons of Mass Destruction Advanced Technology Development*	2.947	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.947
• 128/0605000BR/RL: *Counter Weapons of Mass Destruction Systems Development*	1.203	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.203

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 2021 Defense Threat Reduction Agency			Date: February 2020
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
RM: *WMD Counterforce Technologies*	118.311	11.342	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	129.653

Note

Beginning in FY 2020, efforts in this project are captured under project RG-Counter Weapons of Mass Destruction (WMD) Technologies and Capabilities Development.

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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: RM: WMD Counterforce Technologies	11.342	0.000	0.000	0.000	0.000
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 2020 Plans:*** N/A ***FY 2021 Base Plans:*** N/A ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** N/A					
Accomplishments/Planned Programs Subtotals	11.342	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency		Date: February 2020
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*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• 29/0603160BR/RM: *Counter Weapons of Mass Destruction Advanced Technology Development*	40.365	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	40.365

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 2021 Defense Threat Reduction Agency			Date: February 2020
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research*	Project (Number/Name) RR / *CWMD Test and Evaluation*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
RR: *CWMD Test and Evaluation*	99.424	14.204	17.816	18.156	0.000	18.156	18.451	17.775	18.131	18.493	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Countering WMD Test and Evaluation project provides a unique national test capability for simulated 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 project leverages 50 years of expertise in investigating weapons effects and target response across the spectrum of hostile environments that could be created by proliferant 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 DoD and supports the counterproliferation pillar of the National Strategy to Counter WMD.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: RR: Countering WMD Test and Evaluation	14.204	17.816	18.156	0.000	18.156
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 2020 Plans:*** - Develop seismo-acoustic arrays as test diagnostics (both hardware and algorithms) and tools for assessing decoupling/coupling. - Continue reconstitution of instrumentation and diagnostics of sensor infrastructure capabilities in support of CWMD technology development projects. - Conduct diagnostics, instrumentation, and explosives handling research in support of other testing and compliance initiatives. - Develop and test WMD and explosives sensors and WMD countermeasures to support Combatant Command (CCMD) requirements. - Expand existing defeat technologies, tools, and capabilities for signature characterization in support of exercises and planning events at the Nevada Test Bed. - 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 2021 Defense Threat Reduction Agency		Date: February 2020
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research*	**Project (Number/Name)** RR / *CWMD Test and Evaluation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- 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. - Develop the test infrastructure to test transportable system to identify signature characterization that supports existing defeat technologies, tools, and capabilities. - Design and develop a data architecture that provides for the integration of RD department data from multiple RDT&E programs into an enterprise storage solution, curate compiled data from T&E events and move to an existing data center, develop portals for interagency access to data, and execute three initial data analytics demonstrations.					
FY 2021 Base Plans: - Develop seismo-acoustic arrays as test diagnostics (both hardware and algorithms) and tools for assessing decoupling/coupling. - Continue reconstitution of instrumentation and diagnostics of sensor infrastructure capabilities in support of CWMD technology development projects. - Develop additional diagnostics, instrumentation, and explosives handling research in support of other testing and compliance initiatives. - Develop and test WMD and explosives sensors and WMD countermeasures to support CCMD requirements. - Develop existing defeat technologies, tools, and capabilities for signature characterization in support of exercises and planning events at the Nevada Test Bed. - 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. - 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. - Develop the test infrastructure to test transportable system to identify signature characterization that supports existing defeat technologies, tools, and capabilities. - Develop tools and data analytics for delivery to CCMDs in direct response to existing capability gaps. - Complete data architecture implementation to enable interagency partnerships at an unclassified level. - Complete development of portals for all identified external collaborations. - Perform two data analytics demonstrations and deliver two additional tools to the CCMDs.					
FY 2021 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency		Date: February 2020
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research*	**Project (Number/Name)** RR / *CWMD Test and Evaluation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** The increase from FY 2020 to FY 2021 is due to inflation.					
Accomplishments/Planned Programs Subtotals	14.204	17.816	18.156	0.000	18.156

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Competitive selection of most appropriate performers to fulfill science and technology development needs.