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

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603160BR / <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>
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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	2,234.299	275.246	330.065	366.659	0.000	366.659	340.184	348.918	356.837	363.972	Continuing	Continuing
RA: <i>CWMD Cross-Cutting Technical and Information Sciences</i>	68.860	18.080	34.825	50.019	0.000	50.019	46.279	49.207	50.708	51.721	Continuing	Continuing
RD: <i>Nuclear Technologies and Capabilities Development</i>	64.946	21.193	70.153	51.416	0.000	51.416	51.480	53.081	55.547	56.659	Continuing	Continuing
RE: <i>Counter-Terrorism Technologies</i>	858.849	108.964	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	967.813
RF: <i>Forensics Technologies</i>	459.463	30.947	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	490.410
RG: <i>Counter WMD Technologies and Capabilities Development</i>	175.576	22.354	225.087	265.224	0.000	265.224	242.425	246.630	250.582	255.592	Continuing	Continuing
RI: <i>Nuclear Survivability</i>	57.782	8.583	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	66.365
RL: <i>Nuclear & Radiological Effects</i>	11.895	2.947	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.842
RM: <i>WMD Counterforce Technologies</i>	197.217	40.365	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	237.582
RT: <i>Target Assessment Technologies</i>	339.711	21.813	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	361.524

Note
 In FY 2020, Defense Threat Reduction Agency (DTRA) consolidated program element 0603160BR 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 projects RE-Counter-Terrorism Technologies, RM-WMD Counterforce Technologies, RR-CWMD Test and Evaluation, and RT-Target Assessment 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 Advanced Technology Development portfolio is aligned with strategic planning objectives as well as with Science and Technology (S&T) investment direction established annually by the Defense Threat Reduction Agency (DTRA). The objectives directly support policy and planning guidance from the Executive Office of the President, the Department of Defense (DoD), and the broader Weapons of Mass Destruction (WMD) threat reduction community.

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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603160BR / <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>
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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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	280.858	340.065	333.624	-	333.624
Current President's Budget	275.246	330.065	366.659	-	366.659
Total Adjustments	-5.612	-10.000	33.035	-	33.035
• Congressional General Reductions	-	-10.000			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	1.041	-			
• SBIR/STTR Transfer	-6.653	-			
• Realignment	-	-	33.035	-	33.035

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

Project: RM: *WMD Counterforce Technologies*

Congressional Add: *Target Sensing Technologies*

	FY 2019	FY 2020
Congressional Add Subtotals for Project: RM	10.000	0.000
Congressional Add Totals for all Projects	10.000	0.000

Change Summary Explanation

The Congressional reduction in FY 2020 is for excess and unjustified growth. The increase in FY 2021 from the previous President's Budget submission is due to increased investment in WMD counterterrorism activities including the improvement of Combatant Commanders' offensive capabilities for render safe, pathway defeat, critical infrastructure defeat, and improved CWMD Joint Intelligence Preparation of the Operational Environment (JIPOE) and Preparation of the Environment (PE) capabilities. This increase also supports efforts to develop, integrate, demonstrate, and transition CWMD advanced sensors, surveillance, and defeat planning technologies in support of the warfighter. DTRA intends to increase research and development in CWMD target assessment technologies including tools for the characterization of CWMD targets across all Combatant Commands. Additionally, DTRA realigned of the CWMD situational awareness for the CWMD Information Integration Cell (CIIC) from program element 0602718BR to better reflect the nature of this activity.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency										Date: February 2020		
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 / 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	68.860	18.080	34.825	50.019	0.000	50.019	46.279	49.207	50.708	51.721	Continuing	Continuing

A. Mission Description and Budget Item Justification

The CWMD Cross-Cutting Technical and Information Sciences project provides technical expertise through continuous reach-back and quick reaction 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)

Title: RA: CWMD Cross-Cutting Technical and Information Sciences

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 2020 Plans:

- Develop a robust quick reaction capability to rapidly transition both material and non-material developmental technologies to fielded solutions. Develop acquisition expertise, innovation tools, and agile contract solutions to more effectively deliver capabilities to the warfighter as urgent operational requirements emerge.
- Continue to provide tailored support to DoD with Technical Reachback via processes, capabilities, and expertise in WMD and explosives modeling and simulation. 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.
- Continue to develop capabilities in support of United States Strategic Command (USSTRATCOM) and United

FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
18.080	34.825	50.019	0.000	50.019

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Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	Project (Number/Name) RA / <i>CWMD Cross-Cutting Technical and Information Sciences</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p>States Northern Command (USNORTHCOM) that predict and simulate Higher Order Effects, including the spread of infectious diseases, WMD protection measures, DoD response efforts, and force health protection measures.</p> <p>FY 2021 Base Plans:</p> <ul style="list-style-type: none"> - Develop processes, capabilities and expertise in order to deliver rapid responses to Requests for Information as DOD's only resource providing 24/7/365 WMD subject matter expertise and analyses to customers across the full spectrum of Chemical, Biological, Radiological, Nuclear, and high yield Explosives (CBRNE) in support of Combatant Command (CCMD) plans and operations. - 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 CCMD force health protection and consequence management planning. - Utilize acquisition expertise, innovation tools, and agile contract solutions to deliver capabilities to the warfighter as urgent operational requirements emerge; transition material and non-material developmental technologies to fielded solutions as rapidly as possible. - Provide expanded/enhanced CWMD information sharing and data analysis to meet increasing CCMD and interagency demand for support. <p>FY 2021 OCO Plans: N/A</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: The increase from FY 2020 to FY 2021 is due to the realignment of CWMD situational awareness for the CWMD Information Integration Cell (CIIC) from program element 0602718BR to better reflect the nature of this activity and increased investment in cross-cutting research and development. Additionally, DTRA realigned funds from program element 0602718BR for the improvement of the Automated Solicitation Proposal Management System (ASPMS), a contract and grant management system. This supports the cost sharing agreement between DTRA and the Chemical Biological Defense Program (CBDP).</p>					
Accomplishments/Planned Programs Subtotals	18.080	34.825	50.019	0.000	50.019

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2021</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u>	
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	<u>Total Cost</u>
• 21/0602718BR/RA: <i>Counter Weapons of Mass Destruction Applied Research</i>	36.665	44.167	40.965	0.000	40.965	42.194	42.773	47.564	48.593	Continuing	Continuing
• 162/0605502BR/RA: <i>Small Business Innovation Research</i>	11.315	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.315

Remarks

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs

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Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603160BR / <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>					Project (Number/Name) RD / <i>Nuclear Technologies and Capabilities Development</i>		
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: <i>Nuclear Technologies and Capabilities Development</i>	64.946	21.193	70.153	51.416	0.000	51.416	51.480	53.081	55.547	56.659	Continuing	Continuing

Note

In FY 2020, DTRA consolidated projects RF-Forensics Technologies, RI-Nuclear Survivability, and RL- Nuclear and Radiological Effects in program element 0603160BR, into the renamed project RD-Nuclear Technologies and Capabilities Development. There are no changes to the program element or project structure in the FY 2021 request.

A. Mission Description and Budget Item Justification

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.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p>Title: RD: Nuclear Technologies and Capabilities Development</p> <p>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.</p> <p>FY 2020 Plans:</p> <ul style="list-style-type: none"> - Conduct utility assessment and transition prototype sensors with improved capabilities for wide area search mission - Develop an additional new radiation signature test device (RSTD) to expand test capabilities and detector evaluation - Conduct test and evaluation and utility assessments of Medium Resolution Radioisotope Identification Devices (RIIDs) to inform acquisition decisions by JPEO-CBRND. - Develop prototype wearable detectors to enhance user agility during search operations. - Provide novel isotope identification algorithm to support DOD's unique search needs - Integrate radionuclide sensors into the Integrated Early Warning Technology Demonstration (IEW) - Transition those technologies that demonstrate exceptional capabilities in radiation and nuclear threat detection to advanced technology development - Develop and test techniques to improve the ability of nuclear modeling codes to support tactical DoD operations. - Develop, integrate, and field test technologies and techniques for field analysis of nuclear events to provide (1) rapid answers in support of nuclear threats, attribution processes, and counterproliferation activities, and 2) improved situational awareness on the nuclear battlefield in order to inform tactical and strategic military action. - Develop and test Modular Airborne Gaseous Isotope Collection System (MAGICS) 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. - 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. 	21.193	70.153	51.416	0.000	51.416

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<ul style="list-style-type: none"> - Develop, demonstrate, test, and transition systems that remotely monitor nuclear and radiological threat signatures in small and wide areas. - Develop new or update existing standards and handbooks to capture critical information for DoD to verify and validate mission critical systems. - Develop and collaborate on Satellite System Natural and Nuclear Environment Protection Standard with DoD Stakeholders and the DoD Standardization Program Office. - Produce 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. - Maintain Defense Integration and Management of Nuclear Data Services (DIAMONDS) while developing DIAMONDS Next Generation testing for functional and data validation. Maintain current reporting on both systems to allow for data verification and validation in preparation for initial operating capability release. - Develop natural gas and water/seawater effects models in support of USSTRATCOM Consequences of Execution efforts, linking higher order effects to Political Military Economic Social Infrastructure Information (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. <p>FY 2021 Base Plans:</p> <ul style="list-style-type: none"> - Develop software capability by Q4 FY 2021 to inject nuclear effects with appropriate fidelity into 3-4 studies/analyses/wargames. - Integrate improved contamination identification and avoidance capabilities into Service sensor networks and command and control systems - Provide Long Dwell Spectrometer (LDS) with utility assessment for transition to Technical Support Group - Develop and evaluate a modern replacement for the Alpha Beta detector more suited to support DoD's mission - Evaluate the performance of prototype for use as a replacement for high-pressure Helium-3 tubes for neutron detection in support of the development of modern, novel detector solutions - Provide prototype next generation cadmium zinc telluride (CZT) high-resolution (0.5%) detectors with 200% increase in size - Provide prototype, novel neutron multiplicity detectors that are not Helium-3 based but meet or exceed the performance of Helium-3 based neutron detectors - Provide automated/autonomous system that combines 3D Light Detection and Ranging (LIDAR) mapping with radiation hazard detection and identification of point and wide area hazards for operational utility assessment 					

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Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	Project (Number/Name) RD / <i>Nuclear Technologies and Capabilities Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
- Provide improved aerial search/long dwell capabilities integrated into Mission Design Tool. - Provide novel, low profile, low power photomultiplier that can offer a significant reduction in size, weight and power requirements for radiation detectors - Provide prototype electromagnetic pulse (EMP) sensor(s) for use on the battlefield enabling warfighter situational awareness of EMP effects - Conduct Technology Demonstrations of an integrated sensor network able to rapidly identify and map a radiological contaminated area using mobile, unmanned, manned and unattended sensors - Conduct test and evaluation and utility assessments to inform acquisition decisions for selection of radiation imagers to support DoD missions. FY 2021 OCO Plans: N/A FY 2020 to FY 2021 Increase/Decrease Statement: The decrease from FY 2020 to FY 2021 is a result of the net impact of decreased investment in nuclear warfighting dominance to fund increased investment in nuclear weapons effects targeting, battlefield nuclear warfare, certification without underground testing, and enhanced consequence analysis in program element 0602718BR.					
Accomplishments/Planned Programs Subtotals	21.193	70.153	51.416	0.000	51.416

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021 Base</u>	<u>FY 2021 OCO</u>	<u>FY 2021 Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• 21/0602718BR/RD: <i>Counter Weapons of Mass Destruction Applied Research</i>	21.050	89.860	92.492	0.000	92.492	91.351	93.732	95.307	97.214	Continuing	Continuing
• 128/0605000BR/RD: <i>Counter Weapons of Mass Destruction Systems Development</i>	-	7.500	15.650	0.000	15.650	14.803	13.959	13.118	13.381	Continuing	Continuing

Remarks

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Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	Project (Number/Name) RD / <i>Nuclear Technologies and Capabilities Development</i>

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs.

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

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
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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	858.849	108.964	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	967.813

Note

Beginning in FY 2020, efforts in this project are captured under project RG-Counter WMD Technologies and Capabilities Development.

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, which 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; and (2) USSOCOM CWMD-T Support, which 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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: RE: Counter-Terrorism Technologies	108.964	0.000	0.000	0.000	0.000
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 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	108.964	0.000	0.000	0.000	0.000

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 21/0602718BR/RE: <i>Counter Weapons of Mass Destruction Applied Research</i>	0.850	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.850

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.

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Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	Project (Number/Name) RF / <i>Forensics Technologies</i>
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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: <i>Forensics Technologies</i>	459.463	30.947	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	490.410

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, 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; and (3) nuclear forensic materials exploitation for attribution.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: RF: Forensics Technologies	30.947	0.000	0.000	0.000	0.000
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; and (3) technologies to detect, locate, identify, track, and interdict nuclear and radiological threats, including enablers to their acquisition and development.					
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:					

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
N/A					
Accomplishments/Planned Programs Subtotals	30.947	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
• 21/0602718BR/RF: <i>Counter Weapons of Mass Destruction Applied Research</i>	7.716	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.716
• 128/0605000BR/RF: <i>Counter Weapons of Mass Destruction Systems Development</i>	6.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.016

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.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency										Date: February 2020		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603160BR / <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>					Project (Number/Name) RG / <i>Counter WMD Technologies and Capabilities Development</i>		
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: <i>Counter WMD Technologies and Capabilities Development</i>	175.576	22.354	225.087	265.224	0.000	265.224	242.425	246.630	250.582	255.592	Continuing	Continuing

Note

Defense Threat Reduction Agency's (DTRA) consolidated projects RE-Counter-Terrorism Technologies, RM-WMD Counterforce Technologies, RR-CWMD Test and Evaluation, and RT-Target Assessment Technologies, into the renamed project 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, 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.
2. 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.
3. Counter-terrorism technologies research develops and transitions a full spectrum of new technologies to counter emergent WMD threats. This research supports the U.S. Special Operations Command (USSOCOM) in two areas: (1) counter proliferation research is a collaborative effort to develop advanced, warfighter-unique technologies to defeat terrorist WMD development and acquisition pathways, to include defeat of the devices themselves, while minimizing risks to U.S. forces; and (2) counterterrorism concepts and technologies to integrate and synchronize 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.
4. Counterforce technologies research develops, integrates, demonstrates, and transitions capabilities to find, characterize, assess, and plan for the defeat of WMD threats. This research is focused in three areas: (1) WMD battlespace awareness provides warfighters with tools to find, characterize, and assess WMD threats; (2) weapons effects research provides 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; and (3) innovative engineering of select promising technologies discovered under fundamental and basic

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

5. DTRA provides a unique national test bed capability for simulated weapons of mass destruction (WMD) facility characterization, weapon-target interaction, and WMD facility defeat testing. This test bed is capable of responding to operational needs outside of DTRA's research portfolio and is used by the DoD, Military Services, Combatant Commanders, and other Federal Agencies to evaluate the implications of WMD, conventional weapons, and other special weapons used against U.S. military or civilian systems and targets.

6. Target assessment technologies research develops, integrates, tests, demonstrates, and transitions processes and technologies providing advanced capabilities in the areas of WMD target assessment, automated advanced targeting development (A2TD), facility defeat, and full dimensional defeat. This research develops analytical tools and processes required to: (1) find and characterize WMD targets and associated hard and deeply buried targets (HDBTs); and (2) assess the results of physical and functional defeat mechanisms (such as direct attack). The A2TD initiative seeks to apply emerging computer assisted technologies to automate target characterization for hard targets and WMD targets. The end result will be faster and more efficient characterization of important hard targets and WMD targets. The facility defeat project develops, validates and employs processes and software for characterization and defeat of command specified hard targets in conjunction with DIA analysis. The full dimensional defeat project aims to develop an enterprise capability for 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. The dynamic capabilities encompassed in this effort provide Combatant Commands and the intelligence community tools and processes needed to hold at risk high value hard targets and WMD targets possessed by adversaries.

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	22.354	225.087	265.224	0.000	265.224
Description: Project RG develops advanced technologies and weapon concepts and validates their applicability to CWMD.					
FY 2020 Plans:					
- Finalize full scale testing of the Agent Defeat Penetrator fill.					
- Conduct full-scale prototype demonstration of novel access denial technology in an operational environment.					
- Develop offensive counterproliferation, 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.					
- Integrate High Performance Computing (HPC) software tools into Dynamic Picture of the Operating					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency		Date: February 2020
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	Project (Number/Name) RG / <i>Counter WMD Technologies and Capabilities Development</i>

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p>Environment (DPOE), leveraging capabilities of high performance computing to improve automated analytics to more accurately and quickly identify events, actors, and threats.</p> <ul style="list-style-type: none"> - Develop and integrate advanced algorithms and refine an operational framework for a mission planning tool to enhance warfighter capabilities to search for, detect, and identify chemical threats prior to release. - Demonstrate a miniaturized chemical warfare agent collection and detection capability for trace-level and remote CWMD search missions. - Initiate development of remote sensing and characterization capabilities to aid in the detection and identification of biological weapons production facilities. - Develop, integrate and demonstrate advanced CWMD sensing payloads for both unmanned and remote sensing missions. - Initiate development of a Chemical Intelligence, Surveillance, and Reconnaissance area search mission planning tool to enhance capabilities to search for, detect, and identify chemical threats prior to release. - 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. - Develop enhancements to the Integrated Munitions Effects Assessment modeling and simulation planning tool. - Support for Combatant Command exercises and planning events at the Nevada Test Bed to develop target defeat technologies, tools, and capabilities. - Develop and maintain interagency capabilities and special tests in support of national priority programs and mission requirements. - Integrate engineering rule-based development for automated advanced targeting characterization efforts to meet Combatant Command and IC WMD and HDBT characterization and defeat requirements. - Develop the Functional Full Dimensional Defeat Enterprise process including developing new means for identifying facility functions, determining defeat vulnerabilities in support of attack planning and execution, and determining new battle damage information methods. - Maintain cooperative CWMD project technical exchanges with the United Kingdom (UK) in support of US/UK Project Agreement. - Maintain Coalition Warfare Program Agreement with Republic of Korea for advancement of autonomous tunnel exploitation technologies. - Develop complex geotechnical models for support of geotechnical site characterization of WMD hard target sites. - Develop enhancements and integrate warfighter requirements into client version and the mobile version for Sensitive Site Exploitation. 					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency		Date: February 2020
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	Project (Number/Name) RG / <i>Counter WMD Technologies and Capabilities Development</i>

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

- Develop and assess new analytic capabilities to enhance the warfighter's ability to conduct predictive analysis and forecast potential WMD threats informing future CWMD requirements.

FY 2021 Base Plans:

- Deliver a streamlined Underground Facility (UGF) characterization tool incorporating Automated Advanced Targeting Development (A2TD) automation.
- Deliver Full Dimensional Defeat Enterprise (FDDE) planning visualization tool for mobile deployment
- Achieve Initial Operational Capability of System of Systems Facility Defeat Methods for Combatant Command Course of Action development.
- Deliver Advanced Solid Mechanics computational tools in support of Combatant Command requirements.
- Begin development of second generation HPC software tools for DPOE, leveraging capabilities of high performance computing to improve automated analytics to more accurately and quickly identify events, actors and threats .
- Integrate new models into DPOE to assess adversarial groups' intent to conduct chemical or biological weapon attacks.
- Develop and integrate advanced capabilities and refine an operational framework to enhance warfighter capabilities to search for, detect, and identify WMD threats prior to release.
- Extend WMDpedia capabilities to support CWMD Mission Planning incorporating semi-supervised and active machine learning.
- Maintain cooperative CWMD project technical exchange with the United Kingdom (UK) in support of US/UK Project Agreement
- Conduct material science development and applications development to provide advanced materials for use in chemical and biological agent defeat.
- Develop, demonstrate, and transition a ground sensor with multiple modalities for signature detection, classification, and localization for strategic systems defeat..
- Develop and transition four high explosive prototype fills to the Army.
- Develop, integrate and demonstrate advanced CWMD sensing payloads for both unmanned and remote sensing missions.
- Develop machine learning neural networks trained to optimize conventional weapon strikes against hardened and WMD facilities.
- Develop new and enhanced capabilities for defensive vulnerability assessment and offensive WMD defeat modeling and simulation planning tools.

FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency		Date: February 2020
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<ul style="list-style-type: none"> - Investigate, develop, and integrate new technologies for enhancement and protection of autonomous capabilities to provide joint solutions in a multi-domain environment. - Develop CWMD weapon effects modeling algorithms and conduct scaled test series leveraging machine learning and optimization to investigate CWMD weapon effects for enhancing WMD defeat modeling and simulation planning tools and assessing new WMD defeat mechanisms . - Conduct full-scale prototype demonstration of novel access denial technology in an operational environment. - Complete Coalition Warfare Program Agreement with Republic of Korea for advancement of autonomous tunnel exploitation technologies. - 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 and test structural, reactive materials and advanced agent defeat concepts to improve the capability to defeat and/or neutralize WMD-related targets. <p>FY 2021 OCO Plans: N/A</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: The increase from FY 2020 to FY 2021 is due to increased investment in WMD counterterrorism activities including the improvement of Combatant Commanders' offensive capabilities for render safe, pathway defeat, critical infrastructure defeat, and improved CWMD Joint Intelligence Preparation of the Operational Environment (JIPOE) and Preparation of the Environment (PE) capabilities. This increase also supports efforts to develop, integrate, demonstrate, and transition CWMD advanced sensors, surveillance, and defeat planning technologies in support of the warfighter. Finally, DTRA intends to increase research and development in CWMD target assessment technologies including tools for the characterization of CWMD targets across all Combatant Commands.</p>					
Accomplishments/Planned Programs Subtotals	22.354	225.087	265.224	0.000	265.224

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency		Date: February 2020
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	Project (Number/Name) RG / <i>Counter WMD Technologies and Capabilities Development</i>

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 21/0602718BR/RG: <i>Counter Weapons of Mass Destruction Applied Research</i>	7.938	22.253	22.958	-	22.958	22.919	23.715	24.190	24.675	Continuing	Continuing

Remarks

D. Acquisition Strategy
Assessment and selection of best performer for developmental requirements to meet specific military capability needs.

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

Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	Project (Number/Name) RI / <i>Nuclear Survivability</i>
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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: <i>Nuclear Survivability</i>	57.782	8.583	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	66.365

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 human survivability, radiation Hardened nano-electronics, stockpile logistics, and the nuclear Surety Program

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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: RI: Nuclear Survivability	8.583	-	-	-	-
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.					
Accomplishments/Planned Programs Subtotals	8.583	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency		Date: February 2020
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	Project (Number/Name) RI / <i>Nuclear Survivability</i>

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 21/0602718BR/RI: <i>Counter Weapons of Mass Destruction Applied Research</i>	22.632	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	22.632

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.

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

Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	Project (Number/Name) RL / <i>Nuclear & Radiological Effects</i>
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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: <i>Nuclear & Radiological Effects</i>	11.895	2.947	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.842

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, 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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: RL: Nuclear and Radiological Effects	2.947	-	-	-	-
Description: Project RL develops nuclear and radiological assessment modeling tools to support military operational planning, weapons effects predictions, and strategic system design decisions.					
Accomplishments/Planned Programs Subtotals	2.947	-	-	-	-

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
• 21/0602718BR/RL: <i>Counter Weapons of Mass Destruction Applied Research</i>	27.643	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	27.643
• 128/0605000BR/RL: <i>Counter Weapons of Mass Destruction Systems Development</i>	1.203	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.203

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency		Date: February 2020
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	Project (Number/Name) RL / <i>Nuclear & Radiological Effects</i>

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
Remarks											

D. Acquisition Strategy

N/A

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

Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	Project (Number/Name) RM / <i>WMD Counterforce Technologies</i>
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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: <i>WMD Counterforce Technologies</i>	197.217	40.365	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	237.582

Note

Beginning in FY 2020, efforts in this project are captured under project RG-Counter WMD Technologies and Capabilities Development.

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; and (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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: RM: WMD Counterforce Technologies	30.365	-	-	-	-
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.					
Accomplishments/Planned Programs Subtotals	30.365	-	-	-	-

	FY 2019	FY 2020
Congressional Add: Target Sensing Technologies	10.000	0.000
FY 2019 Accomplishments: - Procured four (4) flight test prototypes systems and eight (8) prototype sensor systems for target sensing technologies program. Details classified. - Funded two (2) flight test execution activities using procured flight test prototypes. Details classified. - Funded further development of additional algorithm development and integration with mission performance capabilities, resulting in software configuration control board system recommendations and analysis. Details classified.		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Defense Threat Reduction Agency		Date: February 2020
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	Project (Number/Name) RM / <i>WMD Counterforce Technologies</i>

	FY 2019	FY 2020
- Funded transition planning of program and systems development to Service/Warfighter.		
FY 2020 Plans: N/A		
Congressional Adds Subtotals	10.000	0.000

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 21/0602718BR/RM: <i>Counter Weapons of Mass Destruction Applied Research</i>	11.342	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.342

Remarks

D. Acquisition Strategy

Assessment and selection of best performer for developmental requirements to meet specific military capability needs.

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

Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	Project (Number/Name) RT / <i>Target Assessment Technologies</i>
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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
RT: <i>Target Assessment Technologies</i>	339.711	21.813	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	361.524

Note

Beginning in FY 2020, efforts in this project are captured under project RG-Counter WMD Technologies and Capabilities Development.

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 (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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: RT: Target Assessment Technologies	21.813	-	-	-	-
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.					
Accomplishments/Planned Programs Subtotals	21.813	-	-	-	-

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.