Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Defense Threat Reduction Agency	Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	592.968	163.601	174.221	197.011	-	197.011	-	-	-	-	-	-
RA: *CWMD Cross-Cutting Technical and Information Sciences*	301.322	45.359	40.615	48.112	-	48.112	-	-	-	-	-	-
RD: *Nuclear Technologies and Capabilities Development*	64.448	81.198	92.492	101.229	-	101.229	-	-	-	-	-	-
RG: *Counter WMD Technologies and Capabilities Development*	113.570	20.958	22.958	29.359	-	29.359	-	-	-	-	-	-
RR: *CWMD Test and Evaluation*	113.628	16.086	18.156	18.311	-	18.311	-	-	-	-	-	-

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.

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Defense Threat Reduction Agency	Date: May 2021
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*

B. Program Change Summary ($ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	174.096	174.571	174.915	-	174.915
Current President's Budget	163.601	174.221	197.011	-	197.011
Total Adjustments	-10.495	-0.350	22.096	-	22.096
• Congressional General Reductions	-	-0.350			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-6.268	-			
• SBIR/STTR Transfer	-4.227	-			
• Realignments	-	-	22.096	-	22.096

Change Summary Explanation

The increase in FY 2022 from the previous President's Budget is due to the net impact of 1) the realignment of resources from Project JC - Enable Rapid Capability Delivery in PE 0602134BR and PE 0604134BR to Project RA - CWMD Cross-Cutting Technical and Information Sciences for technology-driven CWMD capability development and evaluation activities to develop organizationally cross-cutting innovative and agile new technologies that more effectively counter the full spectrum of WMD, by anticipating new threats while responding to current and constantly evolving threats, 2) the realignment of resources from Project JS - Assist Situational Understanding in PE 0602134BR to Project RA - CWMD Cross-Cutting Technical and Information Sciences for strategic research and dialogues program activities in support of National Defense Strategy priorities, 3) the realignment and integration of nuclear data analysis applications including operations analysis, modeling & simulation, hazard effects, and Integrated WMD Toolset (IWMDT) from Project RA - CWMD Cross-Cutting Technical and Information Sciences into Project RD - Nuclear Technologies and Capabilities Development in PE 0603160BR to support cloud-ready, cross-cutting platforms, supporting a fuller spectrum of nuclear operations, wargaming, and assessments, 4) Increased investment in Project RD - Nuclear Technologies and Capabilities Development for nuclear survivability priorities, and 5) a downward adjustment for revised economic assumptions (inflation).

Exhibit R-2A, RDT&E Project Justification: PB 2022 Defense Threat Reduction Agency			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
RA: *CWMD Cross-Cutting Technical and Information Sciences*	301.322	45.359	40.615	48.112	-	48.112	-	-	-	-	-	-

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 Strategic Trends Research Initiative (STRI). STRI 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 2020	FY 2021	FY 2022
Title: RA: CWMD Cross-Cutting Technical and Information Sciences	45.359	40.615	48.112
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 2021 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 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. ***FY 2022 Plans:*** - Develop and sustain advanced information technology capabilities enabling CWMD situational understanding and leverage advanced data science techniques to improve threat analysis to better inform operational planning.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Defense Threat Reduction Agency		Date: May 2021
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 2020	FY 2021	FY 2022
- Transition new data science solutions to improve real-time threat analysis into regular operational use. - Leverage non-traditional acquisition means to develop and deliver technical capabilities responsive to urgent, emergent theater requirements in support of critical strategic partners. - Deliver timely technical capabilities in response to COCOM emergent needs that would otherwise not be met in the required timeline. - Provide integrated support for effective transition to advanced development partners by leveraging an overarching assessment approach to capability development efforts to identify promising efforts for potential transition, will improve transition effectiveness rate. - Assist in transition of additional projects that may otherwise not transition effectively to a sustainable partnership. - Utilize new and emergent advanced modeling and simulation tools and development activities to develop two new, integrated CWMD modeling capabilities to support in theater operational planning. - Generate timely and actionable recommendations on mitigation of anticipated future challenges based upon assessment/ analysis of foreign and domestic CBRN trends. - Develop timely and relevant table top exercises and refine strategic dialogues/symposia/fora to accommodate year-upon-year learning and advancement on anticipated future battlespace challenges. - Refine strategic research projects to improve tangible outcomes and achievable recommendations for future activities to counter WMD development and use. - Continue developing quarterly updates to forecasted changes/developments in geopolitical landscapes and the intersection of CBRN and WMD employment systems. - Leverage CBRN community resources to provide in-depth and expert analysis to current and future WMD problem sets.			
FY 2021 to FY 2022 Increase/Decrease Statement: The increase from FY 2021 to FY 2022 is due to the net impact of realigning resources from Project JC - Enable Rapid Capability Delivery in PE 0602134BR and PE 0604134BR to this project for technology-driven CWMD capability development and evaluation activities to develop organizationally cross-cutting innovative and agile new technologies that more effectively counter the full spectrum of WMD, by anticipating new threats while responding to current and constantly evolving threats, 2) realigning resources from Project JS - Assist Situational Understanding in PE 0602134BR to this project for strategic research and dialogues program activities in support of National Defense Strategy priorities, 3) realigning nuclear data analysis applications including operations analysis, modeling & simulation, hazard effects, and Integrated WMD Toolset (IWMDT) from Project RA - CWMD Cross-Cutting Technical and Information Sciences into Project RD - Nuclear Technologies and Capabilities Development to support cloud-ready, cross-cutting platforms, supporting a fuller spectrum of nuclear operations, wargaming, and assessments, 4) realigning WMD counterforce technologies from Project RA - CWMD Cross-Cutting Technical and Information Sciences to Project RG – Counter WMD Technologies and Capabilities Development for advanced analytics activities to increase capabilities			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Defense Threat Reduction Agency		Date: May 2021
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 2020	FY 2021	FY 2022
for DTRA developed characterization and defeat options for this evolving threat technology, and 5) a downward adjustment for revised economic assumptions (inflation).			
Accomplishments/Planned Programs Subtotals	45.359	40.615	48.112

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 31/0603160BR: *Counter Weapons of Mass Destruction Advanced Technology Development*	61.317	46.837	84.660	-	84.660	-	-	-	-	-	-
• 107/0604551BR: *Catapult*	8.110	0.000	7.166	-	7.166	-	-	-	-	-	-
• 143/0605502BR: *Small Business Innovation Research*	13.329	0.000	0.000	-	0.000	-	-	-	-	-	-

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 2022 Defense Threat Reduction Agency			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
RD: *Nuclear Technologies and Capabilities Development*	64.448	81.198	92.492	101.229	-	101.229	-	-	-	-	-	-

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.

5. Delivers integrated applications, data analysis, and AI-enhanced capabilities in cloud-ready, cross-cutting platform supporting full spectrum of nuclear operations, wargaming, and assessments. Provides timely electronic access to Nuclear Testing Archives supporting validation of the effectiveness of the Nuclear Deterrent and survivability of US military assets without a return to nuclear testing.

Exhibit R-2A, RDT&E Project Justification: PB 2022 Defense Threat Reduction Agency		Date: May 2021
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 2020	FY 2021	FY 2022
Title: RD: Nuclear Technologies and Capabilities Development	81.198	92.492	101.229
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 2021 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. - 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 2022 Plans:*** - Sponsor/host one trial nuclear wargame with current Mission Impact of Nuclear Effects Software (MINES) capabilities; advance nuclear wargaming research to include other nuclear weapon effects and incorporate into MINES development. - Develop prototype sensors using novel materials (e.g. CLLBC (Cs2LiLa(Br,Cl)6:Ce, Dual-sided micro- structured semiconductor neutron detectors (DSMSNDs)) for evaluation of military applications. - Develop improved nuclear weapons outputs models that correctly account for radioactive debris, improving estimates of fallout-induced casualties and impacts on space and missile forces. - Develop improved nuclear weapons induced fire ignition models that correctly account for thick fuels, improving estimates of battle and collateral damages from nuclear plans. - Conduct test at the U.S. Army White Sands Missile Range (WSMR) Large Blast Thermal Simulator (LBTS) to quantify combined airblast and thermal effects, improving estimates of impacts to ground maneuver forces operating on a nuclear battlefield. - Integrate toolsets in cloud platform for nuclear planning, NCBRE assessments, and advanced analytics in support of Service and Combatant Command planning and assessments and Conventional Nuclear Integration situational awareness - includes tool development to synthesize necessary modeling data for tool sets. - Provide integration support for nuclear technology programs; support international activities, user groups, nuclear survivability program, and case study reviews. Also utilizes the Nuclear Science and Engineering Research Center to leverage DoD Degree Granting Institutions to develop new capabilities and advance DTRA's mission to support the warfighter.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Defense Threat Reduction Agency		Date: May 2021
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 2020	FY 2021	FY 2022
- Publish updates to nuclear survivability military standards for aircraft, ships, missiles and interceptor. - Support nuclear modernization through the certification of strategic materials and the upgrade of nuclear effects testing and diagnostics. - Provide nuclear survivability operational support through analyses, vulnerability assessments, and the review of mission critical systems. - Deliver enhanced cloud platform with integrated toolsets for nuclear planning, Nuclear, Chemical, Biological, Radiological, and high Explosive (NCBRE) assessments, and advanced analytics for warfighter and Conventional-Nuclear Integration (CNI) situational awareness. - Deliver integrated improved nuclear physics and effects model in theater nuclear planning tool, improving accuracy of nuclear planning capability for US Army and CCMDs. - Provide advanced search and discovery AI/ML algorithms for improved media retrieval capability documents (20%), photographs (2%), and films (.5%), enabling nuclear survivability and effects programs with higher fidelity data. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The increase from FY 2021 to FY 2022 is due to the realignment and integration of nuclear data analysis applications including operations analysis, modeling & simulation, hazard effects, and IWMDT from Project RA - CWMD Cross-Cutting Technical and Information Sciences into this project to support cloud-ready, cross-cutting platforms, supporting a fuller spectrum of nuclear operations, wargaming, and assessments.			
Accomplishments/Planned Programs Subtotals	81.198	92.492	101.229

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 31/0603160BR/RD: *Counter Weapons of Mass Destruction Advanced Technology Development*	62.407	50.816	50.417	-	50.417	-	-	-	-	-	-
• 131/0605000BR/RD: *Counter Weapons of Mass Destruction Systems Development*	9.870	15.650	14.063	-	14.063	-	-	-	-	-	-

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 2022 Defense Threat Reduction Agency			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
RG: *Counter WMD Technologies and Capabilities Development*	113.570	20.958	22.958	29.359	-	29.359	-	-	-	-	-	-

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 2020	FY 2021	FY 2022
Title: RG: Counter WMD Technologies and Capabilities Development	20.958	22.958	29.359
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 2021 Plans:*** - Develop offensive counter-proliferation, counter-WMD technologies in support of Combatant Command requirements. - Develop WMD pathway defeat technologies and threat-specific test articles and analyses. - Develop lighter, smaller, more effective breaching capabilities. - Develop next generation WMD detection technology applications.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Defense Threat Reduction Agency		Date: May 2021
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 2020	FY 2021	FY 2022
- Develop advanced data analytics and technical capabilities to rapidly capture, catalogue and illuminate nefarious activities to counter WMD 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. - 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. - 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. - Initiate studies on novel next generation agent defeat warhead fills and design.			
FY 2022 Plans: - Initiate Next Generation Access Denial capability based on studies conducted in FY 2021. - Develop and transition next generation agent defeat capabilities utilizing enhanced energetics, advanced manufacturing techniques and tactics that improve performance and lethality and reduce production time and cost. - Complete Coalition Warfare Program-Autonomous Tunnel Exploitation with RoK. - Explore operationalizing nontraditional data; Transition WMDpedia. - Complete independent review of forecasting tactics, techniques, and procedures (TTPs), improve regional assessments, validate effectiveness of forecasting TTPs. - Program, plan, and manage Explosive Ordnance Disposal (EOD) diagnostics and defeat projects and deliver technologies. - Program, plan, and manage low-visibility and breaching projects and deliver technologies. - Provide Systems Engineering and Integration support for both internal DTRA programs and provide subject matter expertise to external organizations with efforts related to CWMD and hard and deeply buried target (HDBT) defeat. - Support CCMD operational planning activities while identifying warfighting capability gaps.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Defense Threat Reduction Agency		Date: May 2021
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 2020	FY 2021	FY 2022
- Deliver Targeting Recommendation Packages and conduct training activities as requested by the CCMDs. - Support weapons effects testing programs and weapons development activities. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The increase from FY 2021 to FY 2022 is due to the realignment of WMD counterforce technologies from Project RA - CWMD Cross-Cutting Technical and Information Sciences in this PE for advanced analytics activities to increase capabilities for DTRA developed characterization and defeat options for this evolving threat technology.			
Accomplishments/Planned Programs Subtotals	20.958	22.958	29.359

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 31/0603160BR/RG: *Counter Weapons of Mass Destruction Advanced Technology Development*	201.756	259.006	259.762	-	259.762	-	-	-	-	-	-

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 2022 Defense Threat Reduction Agency			Date: May 2021
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 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
RR: *CWMD Test and Evaluation*	113.628	16.086	18.156	18.311	-	18.311	-	-	-	-	-	-

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 2020	FY 2021	FY 2022
Title: RR: Countering WMD Test and Evaluation	16.086	18.156	18.311
Description: Project RR provides a unique national test bed capability for the study of weapon-target interaction, simulated WMD facility characterization and defeat testing, and evaluation of asymmetric threats observed in theater, to evaluate the implications of WMD and other special weapon use against U.S. military and civilian assets. Additionally, Project RR develops instrumentation and identifies unique threat signatures that can support early detection and development of countermeasures to support Combatant Command needs.			
FY 2021 Plans: - Conduct modernization and reconstitution of CWMD testing and evaluation instrumentation and diagnostics in support of contemporary threats US Forces and interests abroad. - Develop additional diagnostics, instrumentation, and explosives handling research in support of evolving threat testing and compliance initiatives. - Replicate, test, and evaluate identified threat WMD systems and use tactics, techniques, and procedures to support the development of WMD detection, characterization, and countermeasures documented in CCMD requirements. - Develop identification, characterization, and defeat technologies, tools, and capabilities for signature characterization in support of Combatant Command Counter-Threat Test and Evaluation programs that leverage the Nevada National Security Site, as well as other CONUS testbeds. 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 US weapon and adversary threat effects on facilities of interest.			

Exhibit R-2A, RDT&E Project Justification: PB 2022 Defense Threat Reduction Agency		Date: May 2021
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 2020	FY 2021	FY 2022
- Provide a complete capability to characterize and evaluate the threat introduced by automated and autonomous systems when combined with WMD, as well as a means to evaluate the effectiveness of detection, identification, and countermeasures tools developed elsewhere in the DoD. - Develop the system engineering infrastructure to employ the transportable Data Architecture system that supports all DTRA research and development test and evaluation activities. - Develop tools and data analytics for delivery to CCMDs in direct response to existing capability gaps. - Continue the data architecture implementation to enable interagency partnerships at multiple classification levels. - Complete development of portals for all identified external collaborations at a classified and unclassified level. - Perform two data analytics demonstrations and deliver two tools to the CCMDs. ***FY 2022 Plans:*** - Continue to modernize and evolve instrumentation and diagnostics capability to support test and evaluation activities across the WMD spectrum, as well as develop new methods to address the evolving threats - Replicate, test, and evaluate identified threat WMD systems and use tactics, techniques, and procedures to support the development of WMD detection, characterization, and countermeasures documented in CCMD requirements. - Perform threat-relevant test and evaluation activities to document unique signatures that identify, characterize, and determine the effectiveness of defeat techniques for WMD proliferation and production facilities, leveraging the Nevada National Security Site, as well as a novel transportable capability that can replicate specifics threats of interest to the CCMDs. - 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 US weapon and adversary threat effects on facilities of interest. - Employ the capability developed in FY2021 to support the characterization and evaluation of observed automated and autonomous threat systems with WMD elements, and demonstrate progress in the development of algorithms to support the early detection and countermeasures development. - Complete the development of the data architecture, transportable data collection system, and portals to enable data acquisition for all DTRA research and development activities, and the interagency sharing of data at multiple classification levels. - Demonstrate advancement in data analysis techniques, data analytics, and signature-based algorithms to support the development of deliverable tools to the combatant commands. ***FY 2021 to FY 2022 Increase/Decrease Statement:*** The increase from FY 2021 to FY 2022 is due to inflation.			
Accomplishments/Planned Programs Subtotals	16.086	18.156	18.311

Exhibit R-2A, RDT&E Project Justification: PB 2022 Defense Threat Reduction Agency		Date: May 2021
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*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• 31/0603160BR: *Counter Weapons of Mass Destruction Advanced Technology Development*	0.160	0.000	4.523	-	4.523	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

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