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**Department of Defense
Fiscal Year (FY) 2020 Budget Estimates**

March 2019



Defense Threat Reduction Agency

Defense-Wide Justification Book Volume 5 of 5

Research, Development, Test & Evaluation, Defense-Wide

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Defense Threat Reduction Agency • Budget Estimates FY 2020 • RDT&E Program

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**Exhibit R-1, RDT&E Programs
Defense Threat Reduction Agency
Fiscal Year (FY) 2020 Budget Estimates**

Appropriation: RDT&E, Defense-Wide

Date: February 2019

OVERVIEW

The Defense Threat Reduction Agency (DTRA) is the Department of Defense's (DoD) principle Research, Development, Test & Evaluation (RDT&E) program for combating and countering the threat posed by the networks and capabilities of foreign weapons of mass destruction (WMD), improvised explosive devices (IEDs) and other improvised threats. These present an immediate, persistent, and evolving risk to our nation's security. Detecting, deterring and defeating these threats is a primary DoD priority, and the mission of DTRA.

The DTRA RDT&E funding for FY20 will meet critical Combatant Command and Service requirements across the chemical, biological, radiological, nuclear, and improvised threat mission space. These activities address ongoing and emerging strategic, operational, and tactical challenges to sustain and advance DoD's capabilities to provide WMD and improvised threat surveillance, detection, defeat, prevention, nonproliferation, counterproliferation, and consequence management.

DTRA develops information systems and advanced analytical tools to enable the Joint Force, coalition partners and the interagency the ability to synthesize and exchange complex technical information in real time for actionable planning and action. By rapidly delivering material solutions across the WMD and improvised mission space, capabilities are delivered that allow for the identification, detection, prevention, neutralization, exploitation, and mitigation of the impact of WMD and improvised threat use on the battle field. This RDT&E effort directly supports National Defense Strategy Line of Effort (NDS LOE) 1: Build a More Lethal Force.

The RDT&E portfolio includes a basic research initiative that balances the scientific exploration, discovery, and experimentation with near- and mid-term priorities. This portfolio facilitates innovative solutions and technologies that transition to cost effective capabilities. In addition, the RDT&E portfolio includes leading information science, advanced analytics, and modeling and simulation capabilities, while providing operational, near real-time decision support. To ensure that developed capabilities meet warfighter requirements the RDT&E portfolio also includes end-to-end test event planning and management and includes data analysis that supports DoD, federal agencies, and coalition partners counter WMD and improvised threat programs.

The RDT&E portfolio includes a long standing nuclear technology development effort focused on technologies that support a safe, secure, and effective U.S. nuclear deterrent as well as those technologies that prevent a nuclear or radiological attacks against the U.S. or its allies. This portion of the portfolio includes a broad range of issues including: nuclear weapons effects for targeting in support of U.S. strategic deterrence, nuclear survivability standards, and technology supporting the Joint Force, leading edge nuclear detection technologies that can detect, characterize and potentially attribute the use of nuclear material or detonations.

The RDT&E portfolio also develops technologies to counter WMD and improvised threats through the development of: weapons effects and planning capabilities, target sensing and characterization technologies, novel methods for the defeat and destruction of chemical and biological agents, technologies supporting sensing surveillance and reconnaissance (ISR) capabilities and tools and technologies that hold adversary networks at risk by modeling the effects and trade-offs of weapons systems against enemy targets including hard and deeply buried targets.

DTRA continually assesses the total RDT&E portfolio with respect to new and emerging requirements, the current and future threat environment and the continually changing technology landscape. This submission is driven by requirements from the combatant commands that support specific warfighter needs. This submission reflects the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles which supports. DTRA's RDT&E portfolio continues to reflect Services Requirements Review Board reductions previously implemented across the FYDP.

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Department of Defense
FY 2020 President's Budget
Exhibit R-1 FY 2020 President's Budget
Total Obligational Authority
(Dollars in Thousands)

21 Feb 2019

Appropriation -----	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted
Research, Development, Test & Eval, DW	667,569	479,968	183,286	663,254
Total Research, Development, Test & Evaluation	667,569	479,968	183,286	663,254

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Department of Defense
FY 2020 President's Budget
Exhibit R-1 FY 2020 President's Budget
Total Obligational Authority
(Dollars in Thousands)

21 Feb 2019

Appropriation -----	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)
Research, Development, Test & Eval, DW	572,282		164,795	164,795	737,077
Total Research, Development, Test & Evaluation	572,282		164,795	164,795	737,077

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Department of Defense
FY 2020 President's Budget
Exhibit R-1 FY 2020 President's Budget
Total Obligational Authority
(Dollars in Thousands)

21 Feb 2019

Summary Recap of Budget Activities	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted

Basic Research	36,369	37,023		37,023
Applied Research	152,544	155,924		155,924
Advanced Technology Development	316,212	280,858	13,648	294,506
Advanced Component Development And Prototypes	144,934		169,638	169,638
System Development And Demonstration	6,199	6,163		6,163
Management Support	11,311			
Total Research, Development, Test & Evaluation	667,569	479,968	183,286	663,254
Summary Recap of FYDP Programs				

Research and Development	667,569	479,968	183,286	663,254
Total Research, Development, Test & Evaluation	667,569	479,968	183,286	663,254

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Department of Defense
 FY 2020 President's Budget
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 (Dollars in Thousands)

21 Feb 2019

	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)
Summary Recap of Budget Activities					

Basic Research	26,000				26,000
Applied Research	179,096		1,677	1,677	180,773
Advanced Technology Development	340,065		49,528	49,528	389,593
Advanced Component Development And Prototypes	14,021		113,590	113,590	127,611
System Development And Demonstration	13,100				13,100
Management Support					
Total Research, Development, Test & Evaluation	572,282		164,795	164,795	737,077
Summary Recap of FYDP Programs					

Research and Development	572,282		164,795	164,795	737,077
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Defense-Wide
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21 Feb 2019

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21 Feb 2019

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Defense Threat Reduction Agency	667,569	479,968	183,286	663,254
Total Research, Development, Test & Evaluation	667,569	479,968	183,286	663,254

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Defense-Wide
FY 2020 President's Budget
Exhibit R-1 FY 2020 President's Budget
Total Obligational Authority
(Dollars in Thousands)

21 Feb 2019

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

Line No	Program Element Number	Item	Act	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted	S e c
1	0601000BR	DTRA Basic Research	01	36,369	37,023		37,023	U
		Basic Research		36,369	37,023		37,023	
10	0602134BR	Counter Improvised-Threat Advanced Studies	02					U
20	0602718BR	Counter Weapons of Mass Destruction Applied Research	02	152,544	155,924		155,924	U
		Applied Research		152,544	155,924		155,924	
27	0603134BR	Counter Improvised-Threat Simulation	03	23,366		13,648	13,648	U
28	0603160BR	Counter Weapons of Mass Destruction Advanced Technology Development	03	292,846	280,858		280,858	U
		Advanced Technology Development		316,212	280,858	13,648	294,506	
94	0604134BR	Counter Improvised-Threat Demonstration, Prototype Development, and Testing	04	144,934		169,638	169,638	U
105	0604775BR	Defense Rapid Innovation Program	04					U
		Advanced Component Development And Prototypes		144,934		169,638	169,638	
127	0605000BR	Counter Weapons of Mass Destruction Systems Development	05	6,199	6,163		6,163	U
		System Development And Demonstration		6,199	6,163		6,163	
159	0605502BR	Small Business Innovation Research	06	11,311				U
		Management Support		11,311				
Total Research, Development, Test & Eval, DW				667,569	479,968	183,286	663,254	

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

Line No	Program Element Number	Item	Act	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)	Se
1	0601000BR	DTRA Basic Research	01	26,000				26,000	U
		Basic Research		26,000				26,000	
10	0602134BR	Counter Improvised-Threat Advanced Studies	02			1,677	1,677	1,677	U
20	0602718BR	Counter Weapons of Mass Destruction Applied Research	02	179,096				179,096	U
		Applied Research		179,096		1,677	1,677	180,773	
27	0603134BR	Counter Improvised-Threat Simulation	03			49,528	49,528	49,528	U
28	0603160BR	Counter Weapons of Mass Destruction Advanced Technology Development	03	340,065				340,065	U
		Advanced Technology Development		340,065		49,528	49,528	389,593	
94	0604134BR	Counter Improvised-Threat Demonstration, Prototype Development, and Testing	04			113,590	113,590	113,590	U
105	0604775BR	Defense Rapid Innovation Program	04	14,021				14,021	U
		Advanced Component Development And Prototypes		14,021		113,590	113,590	127,611	
127	0605000BR	Counter Weapons of Mass Destruction Systems Development	05	13,100				13,100	U
		System Development And Demonstration		13,100				13,100	
159	0605502BR	Small Business Innovation Research	06						U
		Management Support							
Total Research, Development, Test & Eval, DW				572,282		164,795	164,795	737,077	

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Total Obligational Authority
(Dollars in Thousands)

21 Feb 2019

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1	0601000BR	DTRA Basic Research	01	36,369	37,023		37,023	U
		Basic Research		36,369	37,023		37,023	
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20	0602718BR	Counter Weapons of Mass Destruction Applied Research	02	152,544	155,924		155,924	U
		Applied Research		152,544	155,924		155,924	
27	0603134BR	Counter Improvised-Threat Simulation	03	23,366		13,648	13,648	U
28	0603160BR	Counter Weapons of Mass Destruction Advanced Technology Development	03	292,846	280,858		280,858	U
		Advanced Technology Development		316,212	280,858	13,648	294,506	
94	0604134BR	Counter Improvised-Threat Demonstration, Prototype Development, and Testing	04	144,934		169,638	169,638	U
105	0604775BR	Defense Rapid Innovation Program	04					U
		Advanced Component Development And Prototypes		144,934		169,638	169,638	
127	0605000BR	Counter Weapons of Mass Destruction Systems Development	05	6,199	6,163		6,163	U
		System Development And Demonstration		6,199	6,163		6,163	
159	0605502BR	Small Business Innovation Research	06	11,311				U
		Management Support		11,311				
Total Defense Threat Reduction Agency				667,569	479,968	183,286	663,254	

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FY 2020 President's Budget
Exhibit R-1 FY 2020 President's Budget
Total Obligational Authority
(Dollars in Thousands)

21 Feb 2019

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

Line No	Program Element Number	Item	Act	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)	Se
1	0601000BR	DTRA Basic Research	01	26,000				26,000	U
		Basic Research		26,000				26,000	
10	0602134BR	Counter Improvised-Threat Advanced Studies	02			1,677	1,677	1,677	U
20	0602718BR	Counter Weapons of Mass Destruction Applied Research	02	179,096				179,096	U
		Applied Research		179,096		1,677	1,677	180,773	
27	0603134BR	Counter Improvised-Threat Simulation	03			49,528	49,528	49,528	U
28	0603160BR	Counter Weapons of Mass Destruction Advanced Technology Development	03	340,065				340,065	U
		Advanced Technology Development		340,065		49,528	49,528	389,593	
94	0604134BR	Counter Improvised-Threat Demonstration, Prototype Development, and Testing	04			113,590	113,590	113,590	U
105	0604775BR	Defense Rapid Innovation Program	04	14,021				14,021	U
		Advanced Component Development And Prototypes		14,021		113,590	113,590	127,611	
127	0605000BR	Counter Weapons of Mass Destruction Systems Development	05	13,100				13,100	U
		System Development And Demonstration		13,100				13,100	
159	0605502BR	Small Business Innovation Research	06						U
		Management Support							
Total Defense Threat Reduction Agency				572,282		164,795	164,795	737,077	

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Department of Defense
FY 2020 OCO Review
Exhibit R-1 FY 2020 OCO Review
Total Obligational Authority
(Dollars in Thousands)

21 Feb 2019

Appropriation	FY 2019 OCO Request	FY 2020 Component OCO Request	FY 2020 OSD Round1 OCO Adjustments	FY 2020 OSD Round1 OCO Review	FY 2020 OCO to Base Enduring Requirements	FY 2020 OCO for Base Requirements	FY 2020 OCO for Hurricane
Research, Development, Test & Eval, DW	256,316				164,795		
Total Research, Development, Test & Evaluation	256,316				164,795		

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Department of Defense
 FY 2020 OCO Review
 Exhibit R-1 FY 2020 OCO Review
 Total Obligational Authority
 (Dollars in Thousands)

21 Feb 2019

Appropriation	FY 2020 Total OCO for Base Requirements	FY 2020 Total OCO	FY 2021 OCO	FY 2021 OCO to Base Enduring Requirements	FY 2021 OCO for Base Requirements	FY 2021 Total OCO
Research, Development, Test & Eval, DW		164,795		121,771		121,771
Total Research, Development, Test & Evaluation		164,795		121,771		121,771

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Department of Defense
FY 2020 OCO Review
Exhibit R-1 FY 2020 OCO Review
Total Obligational Authority
(Dollars in Thousands)

21 Feb 2019

	FY 2019 OCO Request	FY 2020 Component OCO Request	FY 2020 OSD Round1 OCO Adjustments	FY 2020 OSD Round1 OCO Review	FY 2020 OCO to Base Enduring Requirements	FY 2020 OCO for Base Requirements	FY 2020 OCO for Hurricane
Summary Recap of Budget Activities -----							
Applied Research					1,677		
Advanced Technology Development	13,648				49,528		
Advanced Component Development And Prototypes	242,668				113,590		
Total Research, Development, Test & Evaluation	256,316				164,795		
Summary Recap of FYDP Programs -----							
Research and Development	256,316				164,795		
Total Research, Development, Test & Evaluation	256,316				164,795		

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Department of Defense
FY 2020 OCO Review
Exhibit R-1 FY 2020 OCO Review
Total Obligational Authority
(Dollars in Thousands)

21 Feb 2019

	FY 2020 Total OCO for Base Requirements	FY 2020 Total OCO	FY 2021 OCO	FY 2021 OCO to Base Enduring Requirements	FY 2021 OCO for Base Requirements	FY 2021 Total OCO
Summary Recap of Budget Activities -----						
Applied Research		1,677		1,711		1,711
Advanced Technology Development		49,528		50,110		50,110
Advanced Component Development And Prototypes		113,590		69,950		69,950
Total Research, Development, Test & Evaluation		164,795		121,771		121,771
Summary Recap of FYDP Programs -----						
Research and Development		164,795		121,771		121,771
Total Research, Development, Test & Evaluation		164,795		121,771		121,771

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Defense-Wide
FY 2020 OCO Review
Exhibit R-1 FY 2020 OCO Review
Total Obligational Authority
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21 Feb 2019

	FY 2019 OCO Request	FY 2020 Component OCO Request	FY 2020 OSD Round1 OCO Adjustments	FY 2020 OSD Round1 OCO Review	FY 2020 OCO to Base Enduring Requirements	FY 2020 OCO for Base Requirements	FY 2020 OCO for Hurricane
Summary Recap of Budget Activities -----							
Applied Research					1,677		
Advanced Technology Development	13,648				49,528		
Advanced Component Development And Prototypes	242,668				113,590		
Total Research, Development, Test & Evaluation	256,316				164,795		
Summary Recap of FYDP Programs -----							
Research and Development	256,316				164,795		
Total Research, Development, Test & Evaluation	256,316				164,795		

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Defense-Wide
FY 2020 OCO Review
Exhibit R-1 FY 2020 OCO Review
Total Obligational Authority
(Dollars in Thousands)

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Summary Recap of Budget Activities						

Applied Research		1,677		1,711		1,711
Advanced Technology Development		49,528		50,110		50,110
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Summary Recap of FYDP Programs						

Research and Development		164,795		121,771		121,771
Total Research, Development, Test & Evaluation		164,795		121,771		121,771

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Defense-Wide
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Total Research, Development, Test & Evaluation	256,316				164,795		

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Defense-Wide
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Defense Threat Reduction Agency		164,795		121,771		121,771
Total Research, Development, Test & Evaluation		164,795		121,771		121,771

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Defense-Wide
FY 2020 OCO Review
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Appropriation: 0400D Research, Development, Test & Eval, DW

Line No	Program Element Number	Item	Act	FY 2019 OCO Request	FY 2020 Component OCO Request	FY 2020 OSD Round1 OCO Adjustments	FY 2020 OSD Round1 OCO Review	FY 2020 OCO to Base Enduring Requirements	FY 2020 OCO for Base Requirements	FY 2020 OCO for Hurricane	S e c
	0602134BR	Counter Improvised-Threat Advanced Studies	02					1,677			U
		Applied Research						1,677			
	0603134BR	Counter Improvised-Threat Simulation	03	13,648				49,528			U
		Advanced Technology Development		13,648				49,528			
	0604134BR	Counter Improvised-Threat Demonstration, Prototype Development, and Testing	04	242,668				113,590			U
		Advanced Component Development And Prototypes		242,668				113,590			
	Total Research, Development, Test & Eval, DW			256,316				164,795			

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Defense-Wide
FY 2020 OCO Review
Exhibit R-1 FY 2020 OCO Review
Total Obligational Authority
(Dollars in Thousands)

21 Feb 2019

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

Line No	Program Element Number	Item	Act	FY 2020 Total OCO for Base Requirements	FY 2020 Total OCO	FY 2021 OCO	FY 2021 OCO to Base Enduring Requirements	FY 2021 OCO for Base Requirements	FY 2021 Total OCO	S e c
--	-----	----	---	-----	-----	-----	-----	-----	-----	-
0602134BR	Counter Improvised-Threat Advanced Studies		02		1,677		1,711		1,711	U
	Applied Research				1,677		1,711		1,711	
0603134BR	Counter Improvised-Threat Simulation		03		49,528		50,110		50,110	U
	Advanced Technology Development				49,528		50,110		50,110	
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	Advanced Component Development And Prototypes				113,590		69,950		69,950	
Total Research, Development, Test & Eval, DW					164,795		121,771		121,771	

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21 Feb 2019

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

Line No	Program Element Number	Item	Act	FY 2019 OCO Request	FY 2020 Component OCO Request	FY 2020 OSD Round1 OCO Adjustments	FY 2020 OSD Round1 OCO Review	FY 2020 OCO to Base Enduring Requirements	FY 2020 OCO for Base Requirements	FY 2020 OCO for Hurricane	S e c
	0602134BR	Counter Improvised-Threat Advanced Studies	02					1,677			U
	Applied Research							1,677			
	0603134BR	Counter Improvised-Threat Simulation	03	13,648				49,528			U
	Advanced Technology Development			13,648				49,528			
	0604134BR	Counter Improvised-Threat Demonstration, Prototype Development, and Testing	04	242,668				113,590			U
	Advanced Component Development And Prototypes			242,668				113,590			
	Total Defense Threat Reduction Agency			256,316				164,795			

R-1OSDR: FY 2020 OCO (OSD Review), as of February 21, 2019 at 09:47:30

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Defense Threat Reduction Agency
FY 2020 OCO Review
Exhibit R-1 FY 2020 OCO Review
Total Obligational Authority
(Dollars in Thousands)

21 Feb 2019

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

Line No	Program Element Number	Item	Act	FY 2020 Total OCO for Base Requirements	FY 2020 Total OCO	FY 2021 OCO	FY 2021 OCO to Base Enduring Requirements	FY 2021 OCO for Base Requirements	FY 2021 Total OCO	S e c
	0602134BR	Counter Improvised-Threat Advanced Studies	02		1,677		1,711		1,711	U
	Applied Research				1,677		1,711		1,711	
	0603134BR	Counter Improvised-Threat Simulation	03		49,528		50,110		50,110	U
	Advanced Technology Development				49,528		50,110		50,110	
	0604134BR	Counter Improvised-Threat Demonstration, Prototype Development, and Testing	04		113,590		69,950		69,950	U
	Advanced Component Development And Prototypes				113,590		69,950		69,950	
Total Defense Threat Reduction Agency					164,795		121,771		121,771	

R-1OSDR: FY 2020 OCO (OSD Review), as of February 21, 2019 at 09:47:30

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Defense Threat Reduction Agency • Budget Estimates FY 2020 • RDT&E Program

Program Element Table of Contents (by Budget Activity then Line Item Number)

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
1	01	0601000BR	DTRA Basic Research.....	Volume 5 - 1

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
10	02	0602134BR	Improvised Threat Reduction Applied Research.....	Volume 5 - 5
20	02	0602718BR	*Counter Weapons of Mass Destruction Applied Research.....	Volume 5 - 11

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
27	03	0603134BR	Counter Improvised-Threat Simulation.....	Volume 5 - 37
28	03	0603160BR	*Counter Weapons of Mass Destruction Advanced Technology Development.....	Volume 5 - 43

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Defense Threat Reduction Agency • Budget Estimates FY 2020 • RDT&E Program

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
94	04	0604134BR	Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing.....	Volume 5 - 75
105	04	0604775BR	Advanced Component Development and Prototypes.....	Volume 5 - 109

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
127	05	0605000BR	*Counter Weapons of Mass Destruction Systems Development.....	Volume 5 - 115

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

Line #	Budget Activity	Program Element Number	Program Element Title	Page
159	06	0605502BR	Small Business Innovation Research.....	Volume 5 - 139

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Defense Threat Reduction Agency • Budget Estimates FY 2020 • RDT&E Program

Program Element Table of Contents (Alphabetically by Program Element Title)

Program Element Title	Program Element Number	Line #	BA	Page
*Counter Weapons of Mass Destruction Advanced Technology Development	0603160BR	28	03.....	Volume 5 - 43
*Counter Weapons of Mass Destruction Applied Research	0602718BR	20	02.....	Volume 5 - 11
*Counter Weapons of Mass Destruction Systems Development	0605000BR	127	05.....	Volume 5 - 115
Advanced Component Development and Prototypes	0604775BR	105	04.....	Volume 5 - 109
Counter Improvised-Threat Simulation	0603134BR	27	03.....	Volume 5 - 37
Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing	0604134BR	94	04.....	Volume 5 - 75
DTRA Basic Research	0601000BR	1	01.....	Volume 5 - 1
Improvised Threat Reduction Applied Research	0602134BR	10	02.....	Volume 5 - 5
Small Business Innovation Research	0605502BR	159	06.....	Volume 5 - 139

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Summary of the Consolidation of Select Projects in DTRA's RDT&E Portfolio

Program Element	Old Project	New Project	Project Name	FY 2019	FY 2020 ¹	Project Consolidation	Investment Changes ²	Project	Project Name	FY 2020 Revised
0602718BR	RD	RD	Detection Technologies	16,860	18,287	74,243	180	RD	Nuclear Technologies and Capabilities Development ³	92,710
	RF	RD	Forensics Technologies	10,257	10,466	(10,466)				
	RI	RD	Nuclear Survivability	32,732	33,723	(33,723)				
	RL	RD	Nuclear and Radiological Effects	29,388	30,054	(30,054)			Counter WMD Technologies and Capabilities Development ³	22,253
	RG	RG	Defeat Technologies	8,959	13,262	12,991	(4,000)	RG		
	RM	RG	WMD Counterforce Technologies	12,780	12,991	(12,991)				
0603160BR	RD	RD	Detection Technologies	26,021	27,110	42,345	698	RD	Nuclear Technologies and Capabilities Development ⁴	70,153
	RF	RD	Forensics Technologies	33,578	32,973	(32,973)				
	RI	RD	Nuclear Survivability	5,783	5,946	(5,946)				
	RL	RD	Nuclear and Radiological Effects	3,427	3,426	(3,426)			Counter WMD Technologies and Capabilities Development ⁴	235,087
	RG	RG	Defeat Technologies	20,277	24,491	172,667	37,929	RG		
	RE	RG	Counter-Terrorism Technologies	108,978	111,060	(111,060)				
	RM	RG	WMD Counterforce Technologies	25,243	25,905	(25,905)				
	RR	RG	Countering WMD Test and Evaluation	12,394	12,389	(12,389)				
	RT	RG	Target Assessment Technologies	33,871	23,313	(23,313)				
0605000BR					0	4,821	2,679	RD	Nuclear Technologies and Capabilities Development ⁵	7,500
	RF		Forensics Technologies	6,163	4,821	(4,821)				

Net of All Project Consolidations

0

Notes:

1. This position is from the FY 2020 column of the FY 2019 President's Budget submission from February 2018.

2. Additional investment changes implemented for these consolidated projects beyond the consolidation actions.

3. In program element 0602718BR, DTRA consolidated projects RF-Forensics Technologies, RI-Nuclear Survivability, and RL-Nuclear and Radiological Effects into the renamed RD-Nuclear Technologies and Capabilities Development beginning in FY 2020. Additionally, DTRA consolidated RM-WMD Counterforce Technologies into the renamed project RG-Counter WMD Technologies and Capabilities Development.

4. In program element 0603160BR, DTRA consolidated projects RF-Forensics Technologies, RI-Nuclear Survivability, and RL-Nuclear and Radiological Effects into the renamed RD-Nuclear Technologies and Capabilities Development beginning in FY 2020. 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.

5. In program element 0605000BR, DTRA consolidated project RF-Forensics Technologies into the renamed project RD-Nuclear Technologies and Capabilities Development.

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ACRONYMS

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

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

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

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

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

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

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

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Defense Threat Reduction Agency **Date:** March 2019

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 1: Basic Research</i>					R-1 Program Element (Number/Name) PE 0601000BR / DTRA Basic Research							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	288.938	36.369	37.023	26.000	-	26.000	25.500	24.500	24.000	24.481	Continuing	Continuing
RU: <i>Basic Research for Countering WMD</i>	288.938	36.369	37.023	26.000	-	26.000	25.500	24.500	24.000	24.481	Continuing	Continuing

A. Mission Description and Budget Item Justification

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

This project aligns with DTRA's strategic objectives that support policy and planning guidance from the Office of the President, the Department of Defense (DoD), and the broader WMD threat reduction and consequence management communities. The portfolio addresses this guidance through S&T investments that support CWMD and reduce global nuclear dangers. Program managers drive interdisciplinary portfolios primarily drawing from physics, chemistry, biology, mathematics, and information and network sciences. The portfolios themselves are broadly focused on fundamental, exploratory research to support the development of: standoff radiological/nuclear detection capabilities; countermeasures and defenses to non-traditional agents; nuclear detection in-depth understanding of the capabilities, values, intent, and decision making of potential adversaries, whether they are states, networks, or individuals; WMD agent defeat technologies; and biologically-based and -inspired materials for DoD applications.

This project maintains a robust, forward-looking portfolio targeting mission-focused research demonstrating scientific merit, technical quality, and the potential for breakthrough discoveries.

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	37.201	37.023	37.229	-	37.229
Current President's Budget	36.369	37.023	26.000	-	26.000
Total Adjustments	-0.832	0.000	-11.229	-	-11.229
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.832	-			
• Realignments	-	-	-11.229	-	-11.229

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 1: Basic Research	R-1 Program Element (Number/Name) PE 0601000BR / DTRA Basic Research	
<u>Change Summary Explanation</u> The decrease in FY 2020 is due to reduced investment in basic research to fund increased investment in technical reachback and quick reaction capabilities in Project RA-CWMD Cross-Cutting Technical and Information Sciences in Program Element 0603160BR. The Basic Research portfolio was restructured to establish a University Partnership (UP) model with a new prioritization process. This process will focus novel UP research on high-priority CWMD gaps, to include energetics and reactives, nuclear data, weapons effects, materials science, machine learning, radiation biology, advanced analytics, and other critical areas. This model reduces administrative burdens and increases technical collaboration with partners focused on current and emerging areas of interest thereby allowing for reduced investment in FY 2020.		

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 1					R-1 Program Element (Number/Name) PE 0601000BR / DTRA Basic Research				Project (Number/Name) RU / Basic Research for Countering WMD			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RU: Basic Research for Countering WMD	288.938	36.369	37.023	26.000	-	26.000	25.500	24.500	24.000	24.481	Continuing	Continuing

A. Mission Description and Budget Item Justification

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

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

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

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

	FY 2018	FY 2019	FY 2020
Title: Project RU: Basic Research for Countering WMD	36.369	37.023	26.000
Description: Project RU funds the exploration and discovery of fundamental scientific knowledge related to DTRA's CWMD mission by research performers from academia, government, and industry.			
FY 2019 Plans:			
- Manage and steer the CWMD Basic Research portfolio, comprised of approximately 150 active basic research awards on three-to five-year cycles. This portfolio continues to address DoD CWMD science and technology requirements, supporting specific priorities focused on current and emerging areas of interest.			
- Support collaborative relationships within the scientific community and ensure progress toward technical objectives through an annual technical review of each grant to assess scientific advancement.			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019		
Appropriation/Budget Activity 0400 / 1		R-1 Program Element (Number/Name) PE 0601000BR / <i>DTRA Basic Research</i>		Project (Number/Name) RU / <i>Basic Research for Countering WMD</i>	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2018	FY 2019	FY 2020
- Support the development of world-class talent in WMD research at universities and laboratories to foster the future Science, Technology, Engineering, and Mathematics (STEM) workforce. - Conduct an Internal Portfolio Review to assess the focus and scope of the portfolio related to CWMD challenges and assess the coordination of CWMD basic research across the DoD mission space and the broader basic research community to avoid duplication and ensure successful partnerships. <i>FY 2020 Plans:</i> - Continue transition toward a university partnership model consisting of consortia focused on select topics. This model reduces administrative burdens and increases technical collaboration with partners focused on current and emerging areas of interest. - Strengthen collaborative relationships within the scientific community and ensure progress toward technical objectives through annual independent technical reviews. - Continue to support the long-term development of a world-class STEM workforce focused on CWMD research. - Continue to conduct an Internal Portfolio Review to assess the focus and scope of basic research related to CWMD challenges. Assess DTRA's coordination of CWMD basic research across DoD and broader basic research community. <i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> The decrease from FY 2019 to FY 2020 is due to reduced investment in basic research to fund increased investment in reachback and quick reaction capabilities in Project RA-CWMD Cross-Cutting Technical and Information Sciences.					
Accomplishments/Planned Programs Subtotals			36.369	37.023	26.000
C. Other Program Funding Summary (\$ in Millions)					
N/A					
Remarks					
D. Acquisition Strategy					
Procurement methods include competitive selection awards through university partnerships, DTRA's Broad Agency Announcement, and collaborative funding through other organizations.					
E. Performance Metrics					
Project performance is measured by the number of publications from active research projects, the number of students trained in science and engineering research supporting DTRA's CWMD mission, the number of participating research organizations actively engaged in university partnerships, and the percentage of research projects transitioned to other programs for further development across DoD's research and engineering enterprise.					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Defense Threat Reduction Agency	Date: March 2019
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Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: Research, Development, Test & Evaluation, Defense-Wide I BA 2: Applied Research					PE 0602134BR I Improvised Threat Reduction Applied Research							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	0.000	1.677	1.677	1.711	1.745	1.780	1.815	Continuing	Continuing
JC: Enable Rapid Capability Delivery	-	0.000	0.000	0.000	0.502	0.502	0.512	0.522	0.533	0.543	Continuing	Continuing
JS: Assist Situational Understanding	-	0.000	0.000	0.000	1.175	1.175	1.199	1.223	1.247	1.272	Continuing	Continuing

Note

Overseas Contingency Operations (OCO) for Enduring Requirements (\$1.677M): OCO for Enduring Requirements are enduring in-theater and in-CONUS costs that will likely remain after combat operations cease. This OCO program element is a new start. Funds enable and provide for urgent and emergent warfighter requirements from Combatant Commands (CCMDs) and Warfighter Senior Integration Group.

A. Mission Description and Budget Item Justification

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

Enable Rapid Capability Delivery. This activity is driven by current threat activities. It enables the timely validation, resourcing, research (basic or applied), and rapid prototype development and delivery to counter booby-trapped structures, buried IEDs, home-made explosives, person/suicide-borne IEDs, and radio-controlled IEDs that continue to impact deployed US Joint force maneuverability and force protection. This includes Science, Technology, Engineering, and Mathematics (STEM) manpower and also enables coordination with other stakeholders and all supporting test and evaluation activities.

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	0.000	0.000	0.000	0.000
Current President's Budget	0.000	0.000	0.000	1.677	1.677
Total Adjustments	0.000	0.000	0.000	1.677	1.677
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Realignments	-	-	0.000	1.677	1.677

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 2: Applied Research	R-1 Program Element (Number/Name) PE 0602134BR / Improvised Threat Reduction Applied Research	
<u>Change Summary Explanation</u> The increase in FY 2020 supports investment in applied research looking for disruptive technologies that will provide a greater than 70% solution to the following investment areas: Stand-Off Detection, Anti-Armor IED (AAIED), System Attributes across the Portfolio (Machine Learning, & Artificial Intelligence), as well as increased investment in future-threat forecasting and innovative analytical research studies leveraging expertise from academia and research institutions in government and industry. These areas of investment continue to be identified time and again as challenging problem sets for the warfighters as identified by the CCMDs and warfighting commands in the CCMD integrated priority lists and JUONs. This is all in support of Assistant Secretary of Defense for Research & Engineering ASD(R&E) guidance and congressional testimony to provide the technological foundation that ensures the U.S. military of both today and tomorrow is the most capable in the fight against IEDs and emerging improvised threats. These resources will be applied to the following: designing and fabricating ultra-light weight auxetic structures that significantly reduce damage to vehicles through reducing deflection upon impact from mine blast; developing the Light Detection and Ranging (LiDAR) and unmanned aerial vehicle cameras needed to create a 3D map of an environment; developing explainable artificial intelligence (XAI) methodologies to enable human understanding of Machine Learning decisions; developing fusion strategies to improve Machine Learning algorithms by including human-in-the- loop knowledge into its learning strategies; developing methods to optimize algorithms through artificial intelligence and machine learning; and forecasting future threat scenarios and threat network resiliency.		

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602134BR / Improvised Threat Reduction Applied Research				Project (Number/Name) JC / Enable Rapid Capability Delivery			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
JC: Enable Rapid Capability Delivery	-	0.000	0.000	0.000	0.502	0.502	0.512	0.522	0.533	0.543	Continuing	Continuing

A. Mission Description and Budget Item Justification

Defense Threat Reduction Agency's (DTRA) takes a deliberate, structured, and proactive approach to meet future capability gaps and requirements through a continuous survey of the research realm. DTRA enables early identification and cultivation of technologies and concepts that are essential in meeting and staying ahead of the evolving improvised threats.

Improvised Threat Reduction Applied Research will fund technology outreach and investigate new technologies and scientific discoveries to progress the US into fields of study that will propel DTRA forward in countering improvised explosive devices (IEDs) and other improvised threats that will impact US Joint Force maneuverability and force protection.

Enable Rapid Capability Delivery. This activity enables the timely validation, resourcing, research, and rapid prototype development and delivery to anti-armor IEDs (i.e., explosively formed projectiles) for which a solution has never been realized.

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

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: JC: Enable Rapid Capability Delivery	0.000	0.000	0.000	0.502	0.502
Description: This project seeks to assess and understand current and emerging technologies to take a proactive approach to rapidly address the constantly evolving environment of the warfighter.					
FY 2019 Plans: N/A					
FY 2020 Base Plans: N/A					
FY 2020 OCO Plans: - Deliver technical reports in response to Requests for Information (RFIs) submitted by DTRA program/system Integrators and initiative evaluation team members. - Convene Joint Lab Board to evaluate the feasibility and practicality of proposed solutions.					
FY 2019 to FY 2020 Increase/Decrease Statement:					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602134BR / <i>Improvised Threat Reduction Applied Research</i>	Project (Number/Name) JC / <i>Enable Rapid Capability Delivery</i>	

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

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
The increase from FY 2019 to FY 2020 supports investment in applied research to gain a better understanding of current and emerging technologies that will improve the warfighter's capability to detect, defeat, identify, neutralize, and mitigate the adversary's improvised threat to better prepare for and meet the needs of the warfighter.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	0.000	0.502	0.502

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

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 27/0603134BR/JC: <i>Counter Improvised-Threat Simulation</i>	23.366	13.648	0.000	49.528	49.528	50.110	50.250	47.887	48.194	Continuing	Continuing
• 94/0604134BR/JC: <i>Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing</i>	117.640	148.772	0.000	103.793	103.793	59.860	109.236	105.258	106.598	Continuing	Continuing

Remarks

D. Acquisition Strategy

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

E. Performance Metrics

The percentage of new technological research papers that bring forward new initiatives to the DTRA portfolio.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602134BR / Improvised Threat Reduction Applied Research				Project (Number/Name) JS / Assist Situational Understanding			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
JS: Assist Situational Understanding	-	0.000	0.000	0.000	1.175	1.175	1.199	1.223	1.247	1.272	Continuing	Continuing
A. Mission Description and Budget Item Justification This funding represents Defense Threat Reduction Agency's (DTRAs) Directed Studies effort, which manages and funds analytical research studies/projects to counter improvised explosive devices (C-IEDs) and emerging improvised threats. This project sponsors innovative studies which leverage expertise from academia and world-class research institutions in government and industry. The program cultivates research community partnerships and is forward-looking to: help understand the environment, threats and vulnerabilities; anticipate and plan for emerging improvised threats; and leverage innovative approaches for future counter improvised threat (C-IT) solutions to prevent or mitigate battlefield operational surprise in support of Combatant Commands (CCMDs) and deployed Warfighters.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: JS: Assist Situational Understanding								0.000	0.000	0.000	1.175	1.175
Description: This project conducts analytical research studies to counter IEDs and emerging improvised threats.												
FY 2019 Plans: N/A												
FY 2020 Base Plans: N/A												
FY 2020 OCO Plans: - Conduct 3-5 research studies to support counter C-IED and emerging improvised threat efforts. - Support collaborative relationships with the analytical community. - Conduct annual project reviews to ensure progress toward study objectives. - Assess the focus and scope of C-IT challenges within our internal portfolio and across the broader analytic community to synchronize efforts and ensure successful partnerships.												
FY 2019 to FY 2020 Increase/Decrease Statement: The increase from FY 2019 to FY 2020 supports increased investment in applied research to support analytical research studies to gain a better understanding of new technologies and scientific discoveries to counter emerging improvised threats.												
Accomplishments/Planned Programs Subtotals								0.000	0.000	0.000	1.175	1.175

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602134BR / <i>Improvised Threat Reduction Applied Research</i>	Project (Number/Name) JS / <i>Assist Situational Understanding</i>	

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

<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u> <u>Base</u>	<u>FY 2020</u> <u>OCO</u>	<u>FY 2020</u> <u>Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 94/0604134BR/JS: <i>Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing</i>	17.504	13.141	9.797	0.000	9.797	10.090	10.286	10.585	10.887	Continuing	Continuing

Remarks

D. Acquisition Strategy

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

E. Performance Metrics

Project performance is measured via the number of deliverables/publications, number of participating research organizations, and percentage of studies transitioned for further development.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Defense Threat Reduction Agency	Date: March 2019
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 2: Applied Research</i>	PE 0602718BR I <i>*Counter Weapons of Mass Destruction Applied Research</i>											
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	1,102.363	152.544	155.924	179.096	-	179.096	182.758	186.223	188.871	200.457	Continuing	Continuing
RA: <i>*CWMD Cross-Cutting Technical and Information Sciences</i>	224.468	40.189	30.603	46.317	-	46.317	48.032	49.312	49.896	58.703	Continuing	Continuing
RD: <i>**Nuclear Technologies and Capabilities Development</i>	29.653	13.745	16.860	92.710	-	92.710	93.612	95.541	97.485	99.433	Continuing	Continuing
RE: <i>Counter-Terrorism Technologies</i>	0.000	0.693	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.693
RF: <i>Forensics Technologies</i>	216.309	6.803	10.257	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	233.369
RG: <i>***Counter WMD Technologies and Capabilities Development</i>	96.456	8.483	8.959	22.253	-	22.253	22.958	22.919	23.715	24.190	Continuing	Continuing
RI: <i>Nuclear Survivability</i>	159.267	25.545	32.732	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	217.544
RL: <i>Nuclear & Radiological Effects</i>	185.241	30.320	29.388	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	244.949
RM: <i>WMD Counterforce Technologies</i>	104.355	13.956	12.780	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	131.091
RR: <i>****CWMD Test and Evaluation</i>	86.614	12.810	14.345	17.816	-	17.816	18.156	18.451	17.775	18.131	Continuing	Continuing

Note

In program element 0602718BR, DTRA consolidated projects RF-Forensics Technologies, RI-Nuclear Survivability, and RL-Nuclear and Radiological Effects into the renamed RD-Nuclear Technologies and Capabilities Development beginning in FY 2020. Additionally, DTRA consolidated RM-Weapons of Mass Destruction (WMD) Counterforce Technologies into the renamed project RG-Counter WMD Technologies and Capabilities Development.

*Project RA title changes from Information Sciences and Applications to Countering Weapons of Mass Destruction (CWMD) Cross-Cutting Technical and Information Sciences in FY 2020.

**Project RD title changes from Detection Technologies to Nuclear Technologies and Capabilities Development in FY 2020.

***Project RG title changes from Defeat Technologies to Counter WMD Technologies and Capabilities Development in FY 2020.

****Project RR title changes from Countering WMD Test and Evaluation to CWMD Test and Evaluation in FY 2020.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Defense Threat Reduction Agency	Date: March 2019
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 0602718BR I <i>*Counter Weapons of Mass Destruction Applied Research</i>
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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 Office of the President, the Department of Defense (DoD), and the broader WMD threat reduction community.

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

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	157.908	161.151	163.576	-	163.576
Current President's Budget	152.544	155.924	179.096	-	179.096
Total Adjustments	-5.364	-5.227	15.520	-	15.520
• Congressional General Reductions	-	-4.000			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-4.676	-			
• Realignments	-	-	15.520	-	15.520
• FFRDC	-0.688	-1.227	-	-	-

Change Summary Explanation

The increase in FY 2020 is due to the net effect of increased investment in the CWMD Information Integration Cell addressing higher Combatant Command (CCMD) and Interagency demand for CWMD information sharing and data analysis support, increased investment in the institutionalization of a quick reaction capability to rapidly transition both material and non-material developmental technologies to fielded solutions, increased investment in nuclear detection in order to support battlespace efficacy in terms of situational awareness and interdiction as early as possible along the threat timeline, multi-modal CWMD modeling & simulation capabilities to better inform operational decision makers of WMD defeat options and their effects, test instrumentation and data acquisition systems to

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 2: Applied Research</i>	R-1 Program Element (Number/Name) PE 0602718BR / <i>*Counter Weapons of Mass Destruction Applied Research</i>	
remain “cutting edge” in gathering test data for customers, and decreased investment in Counter-small Unmanned Aerial Systems (C-sUAS). There is 9.5% real growth in this program element from the previous President's Budget submission which will be discussed at the R-2a project level.		

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RA: *CWMD Cross-Cutting Technical and Information Sciences	224.468	40.189	30.603	46.317	-	46.317	48.032	49.312	49.896	58.703	Continuing	Continuing

Note

*Project RA title changes from Information Sciences and Applications to CMWD Cross-Cutting Technical and Information Sciences in FY 2020.

A. Mission Description and Budget Item Justification

The Information Sciences and Applications project develops concepts and technologies in the areas of high-speed information processing, modeling and simulation, signal detection, and data-driven decision analysis in support of the Defense Threat Reduction Agency's (DTRA's) technical reachback teams. This project develops and maintains continuously improving collaborative architectures and 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 CWMD partners. This effort also funds research activities that benefit the public through analysis and engagement to reduce and counter threats posed by WMD via the Project on Advanced Systems and Concepts for Countering WMD (PASCC). PASCC cultivates national and international research community partnerships across domains, bringing scientific, technical, and social science experts together to help understand and anticipate WMD capabilities and threats.

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

Title: RA: CWMD Cross-Cutting Technical and Information Sciences	FY 2018	FY 2019	FY 2020
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.	40.189	30.603	46.317
FY 2019 Plans: - Release software update for Force-on-Force Evaluation and Analysis of Key Performance Parameters (FREAK), which provides Integrated Force-on-Force Models for Course of Action Analysis, CONOPS Development, and Sensor Performance Prediction. - Release software update for Virtual Radiation Training through Ubiety System (VIRTUS), which provides a mobile phone based radiation sensor emulator for search training. - Release software update for Android Tactical Assault Kit (ATAK), which incorporates CWMD capabilities into a mobile phone based tactical common operating picture - for customers to support new, emerging and updated modeling and simulation requirements. - Continue to sustain a shared, rapidly configurable computational environment to serve as the common R&D backbone: core analytic tools, shared information, and applications. Provide analytic solutions and shared computations environments to support R&D and operational needs.			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / <i>*Counter Weapons of Mass Destruction Applied Research</i>	Project (Number/Name) RA / <i>*CWMD Cross-Cutting Technical and Information Sciences</i>
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018
- Transition analytic investments, including machine learning, natural language processing, and statistical analytics technologies to the common R&D backbone for agency wide access. - Improve decision making processes and time-to-decision cycles by researching, developing, integrating, deploying, and managing advanced data analytics, data visualizations, and knowledge management capabilities to support DTRA's and associated mission partners'/customers' validated operational capability requirements. - Establish and advise on approaches to leverage cloud-based capabilities to improve data access, interoperability, and policy compliance. Implement and enforce system designs to support compliance with DoD cybersecurity policies. - Further develop and implement a sustainable and scalable analytic capability to discover emerging and disruptive technologies in support of efforts to anticipate and meet new and emerging requirements. FY 2020 Plans: - Support select NATO nations' access to a shared WMD and explosives modeling capability as requested by individual nations through the Partnership of Cooperation agreements . - Enhance FREAK cloud architecture to increase availability of chemical/biological personnel casualty and detector models that support Course of Action Analysis, Concept of Operations Development, and Sensor Performance Prediction. - Provide software releases to include DoD customer detector requests for VIRTUS, which provides a mobile phone-based radiation sensor emulator for search training. - Provide increased stand-alone modeling capability for ATAK, which incorporates CWMD capabilities into a mobile phone-based tactical common operating picture, to support new, emerging and updated modeling and simulation requirements. - Transition the Enhanced Mapping and Positioning System (EMAPS) to the Joint Program Executive Office, Chemical and Biological Defense. This system uses LIDAR to automatically create real-time 2D/3D annotated physical maps of areas denied to the Global Positioning System. FY 2019 to FY 2020 Increase/Decrease Statement: The increase from FY 2019 to FY 2020 is due to increased investment in a new CWMD Information Integration Cell (CIIC) to for integrated information sharing capabilities to address higher CCMD and Interagency demand for CWMD information sharing and data analysis support, and increased investment to institutionalize a Quick Reaction Capability to rapidly transition both material and non-material developmental technologies to fielded solutions. This aligns with the National Defense Strategy's Level of Effort 3: Reform the Department. Develop acquisition expertise, innovation tools, and agile contract solutions to more effectively deliver capabilities to the warfighter as urgent operational requirements emerge. Additionally, there was increased investment in multi-modal CWMD modeling and simulation capabilities integration of new modeling techniques and capabilities with existing programs and models to leverage the best cutting edge technology for improved CWMD modeling and simulation capabilities in support		FY 2019
		FY 2020

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
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 2018	FY 2019	FY 2020
of operational planning and mission requirements to better inform operational decision makers of WMD defeat options and their effects.												
Accomplishments/Planned Programs Subtotals										40.189	30.603	46.317
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost	
• 28/0603160BR/RA: Counter Weapons of Mass Destruction Advanced Technology Development	17.732	11.286	34.825	-	34.825	30.722	32.739	35.660	37.254	Continuing	Continuing	
• 105/0604775BR/RA: Advanced Component Development and Prototypes	-	-	14.021	-	14.021	12.564	6.800	6.800	6.700	Continuing	Continuing	
• 159/0605502BR/RA: Small Business Innovation Research	11.311	-	-	-	-	-	-	-	-	Continuing	Continuing	
Remarks												
D. Acquisition Strategy												
Competitive selection of most appropriate performers to fulfill science and technology development needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.												
E. Performance Metrics												
Percentage of Counter WMD technologies selected for transition to Budget Activity (BA) 3, Advanced Technology Development (ATD) and BA 4, Advanced Component Development and Prototypes (ACD&P).												

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RD: **Nuclear Technologies and Capabilities Development	29.653	13.745	16.860	92.710	-	92.710	93.612	95.541	97.485	99.433	Continuing	Continuing

Note

In program element 0602718BR, Defense Threat Reduction Agency's (DTRA) consolidated projects RF-Forensics Technologies, RI-Nuclear Survivability, and RL-Nuclear and Radiological Effects into the renamed RD-Nuclear Technologies and Capabilities Development beginning in FY 2020. There was 1.9% real growth in this project.

****Project RD title changes from Detection Technologies to Nuclear Technologies and Capabilities Development in FY 2020.**

A. Mission Description and Budget Item Justification

Nuclear Technologies and Capabilities Development encompasses the following related areas.

1. Research, development, test, and evaluation 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 DoD requirements for countering terrorism, counterproliferation, nonproliferation, countering rogue states, and homeland defense.
2. Research, development, test, and evaluation (RDT&E) to systematically study signatures associated with adversary nuclear programs and nuclear detonations gain knowledge or understanding necessary to determine technical capabilities needed to improve Department of Defense (DoD) contingency planning activities; gain knowledge or understanding necessary to improve DoD situational awareness on the nuclear battlefield; gain knowledge or understanding necessary to improve capabilities to attribute the source of a nuclear.
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 Department of Defense 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 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.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019		
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		
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.				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
Title: RD: Nuclear Technologies and Capabilities Development		13.745	16.860	92.710
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 2019 Plans: - Develop a contamination avoidance capability. - Develop wearable neutron detectors made of Boron-Coated Straw in support of the development of modern, novel detector solutions to revolutionize CONOPs. - Develop detailed studies to systematically identify new nuclear threat signatures, breaking down the problem geographically to distinguish between allies and foes, and to determine assets and coverage. - Transition those technologies that demonstrate exceptional capabilities in radiation and nuclear threat detection to advanced technology development. - Develop tools for pre-detonation diagnostics, leveraging high spatial resolution nuclear imagers, multiplicity algorithms, trace analysis tools, and high-fidelity test objects to increase capability to characterize threats.				
FY 2020 Plans: - Continue to develop a contamination avoidance capability. - Continue to develop wearable neutron detectors made of Boron-Coated Straw in support of the development of modern, novel detector solutions to revolutionize CONOPs. - Continue to 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. - Continue to develop tools for pre-detonation diagnostics, leveraging high spatial resolution nuclear imagers, multiplicity algorithms, trace analysis tools, and high-fidelity test objects to increase capability to characterize threats. - Continue to transition those technologies that demonstrate exceptional capabilities in radiation and nuclear threat detection to advanced technology development. - Improve DoD decision-making by gaining knowledge to determine how to adapt nuclear sensor capabilities to quickly characterize nuclear explosions on the nuclear battlefield and inform tactical, operational, and strategic military actions. - Systematically study techniques to improve the ability of nuclear modeling codes to support tactical DoD operations.				

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency								Date: March 2019			
Appropriation/Budget Activity 0400 / 2				R-1 Program Element (Number/Name) PE 0602718BR / <i>*Counter Weapons of Mass Destruction Applied Research</i>				Project (Number/Name) RD / <i>**Nuclear Technologies and Capabilities Development</i>			
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2018	FY 2019	FY 2020	
- Continue to develop system-generated electromagnetic pulse follow-on efforts and electromagnetic pulse coupling and response efforts to deliver high-fidelity early-time electromagnetic analysis and operational tools for US and Allied nuclear weapon effects stakeholders. - Continue research on improved nuclear battlefield casualty assessment and medical planning for nuclear/radiological events. - Publish updates to Weapons Output eBooks, delivering high-fidelity nuclear source terms and historical test data for use in, and validation of, modern weapon effects codes. - Continue to develop petroleum effects models for nuclear targeting capabilities linking higher order impacts to Political Military Economic Social Infrastructure Information (PMESII) analyses. <i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> The increase from FY 2019 to FY 2020 is due to the realignment of Projects RF-Forensics Technologies, RI-Nuclear Survivability, and RL-Nuclear and Radiological Effects into Project RD-Nuclear Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles. Real growth in this Project is 1.9% and is for increased investment in nuclear detection in order to support battlespace efficacy for situational awareness and interdiction as early as possible along the threat timeline.											
Accomplishments/Planned Programs Subtotals								13.745	16.860	92.710	
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 28/0603160BR/RD: <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	21.923	26.021	70.153	-	70.153	64.234	60.840	62.070	61.168	Continuing	Continuing
• 127/0605000BR/RD: <i>Counter Weapons of Mass Destruction Systems Development</i>	-	-	7.500	-	7.500	7.650	7.803	7.959	8.118	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
Competitive selection of most appropriate performers to fulfill science and technology development needs. Performer base includes best-of-breed researchers across the Department of Defense and other government agency laboratories, academia, industry and international partner organizations.											

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / <i>*Counter Weapons of Mass Destruction Applied Research</i>	Project (Number/Name) RD / <i>**Nuclear Technologies and Capabilities Development</i>
E. Performance Metrics Percentage of Counter WMD technologies selected for transition to Budget Activity (BA) 3, Advanced Technology Development (ATD) and BA 4, Advanced Component Development and Prototypes (ACD&P).		

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research				Project (Number/Name) RE / Counter-Terrorism Technologies			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RE: Counter-Terrorism Technologies	0.000	0.693	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.693

A. Mission Description and Budget Item Justification

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

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

	FY 2018	FY 2019	FY 2020
Title: RE: Counter-Terrorism Technologies	0.693	-	-
Description: Project RE provides research and development (R&D) support to Joint U.S. Military Forces, specifically U.S. Special Operations Command (USSOCOM), in the areas of Explosive Ordnance Disposal Device Defeat; Counter WMD technologies for warfighters; the USSOCOM Countering WMD – Terrorism Support program.			
Accomplishments/Planned Programs Subtotals			
	0.693	-	-

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

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 28/0603160BR/RE: <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	101.737	108.978	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	-

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

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

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research				Project (Number/Name) RF / Forensics Technologies			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RF: Forensics Technologies	216.309	6.803	10.257	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	233.369

Note

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

A. Mission Description and Budget Item Justification

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

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

Title: RF: Forensics Technologies	FY 2018	FY 2019	FY 2020
Description: Project RF develops nuclear forensics technologies providing accurate, rapid and reliable means to collect, analyze, and evaluate prompt data and debris from a nuclear or radiological event in support of exploitation and attribution efforts.	6.803	10.257	-
FY 2019 Plans: - Reduce the fixed lab process timeline by 50%, increasing confidence and decreasing technical uncertainties in the materials forensics results. This will be accomplished through expanded interpretability of test results, improvement in quality of ground samples, including complex debris from transient environments, and optimization of current debris analysis constructs. - Evaluate and extract relevant data from historic nuclear tests to help calibrate codes to support device characterization improvements. - Expand signature databases with appropriate information on generic designs, known weapon designs, and known effects. - Increase capability development efforts in ubiquitous networks and airborne platforms to support prompt diagnostics and forensics technology improvements. - Conduct/lead a DoD and interagency end-to-end nuclear forensics process technology demonstration and evaluation of DTRA-developed technologies/methodologies to assess NTNF process improvements. - Identify potential development of a new advanced capability in forensic conclusion confidence, timeliness, and accuracy, and assist in assessing contribution to interagency attribution process and decisions.			
FY 2019 to FY 2020 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency								Date: March 2019			
Appropriation/Budget Activity 0400 / 2				R-1 Program Element (Number/Name) PE 0602718BR / <i>*Counter Weapons of Mass Destruction Applied Research</i>				Project (Number/Name) RF / <i>Forensics Technologies</i>			
B. Accomplishments/Planned Programs (\$ in Millions)											
								FY 2018	FY 2019	FY 2020	
The decrease from FY 2019 to FY 2020 is due to the realignment of Project RF-Forensics Technologies into Project RD-Nuclear Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles.											
Accomplishments/Planned Programs Subtotals								6.803	10.257	-	
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 28/0603160BR/RF: <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	25.535	33.578	-	-	-	-	-	-	-	-	-
• 127/0605000BR/RF: <i>Counter Weapons of Mass Destruction Systems Development</i>	6.199	6.163	-	-	-	-	-	-	-	-	-
Remarks											
D. Acquisition Strategy Competitive selection of most appropriate performers to fulfill science and technology development needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.											
E. Performance Metrics Percentage of Counter WMD technologies selected for transition to Budget Activity (BA) 3, Advanced Technology Development (ATD) and BA 4, Advanced Component Development and Prototypes (ACD&P).											

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RG: ***Counter WMD Technologies and Capabilities Development	96.456	8.483	8.959	22.253	-	22.253	22.958	22.919	23.715	24.190	Continuing	Continuing
Note DTRA consolidated RM-Weapons of Mass Destruction (WMD) Counterforce Technologies into the renamed project RG-Counter WMD Technologies and Capabilities Development beginning in FY 2020. There is -9.5% real growth in this project. ***Project RG title changes from Defeat Technologies to Counter WMD Technologies and Capabilities Development in FY 2020												
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. Life sciences research develops technologies to find, locate, mitigate, and defeat WMD using bio-organisms or components.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2018	FY 2019	FY 2020	
Title: RG: Counter WMD Technologies and Capabilities Development									8.483	8.959	22.253	

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019	
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / <i>*Counter Weapons of Mass Destruction Applied Research</i>	Project (Number/Name) RG / <i>***Counter WMD Technologies and Capabilities Development</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019
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 2019 Plans: - Conduct an incremental capability demonstration for an autonomous systems technology update to the Modular Autonomous Counter-WMD System B (MACS-B). - Develop future MACS advanced holistic payloads, refining the concept and conducting technology investigation. - Develop Combined Effects Payload for Access Denial (CEPAD) payload. - Collect signatures on threat-improvised rotary winged and fixed wing IED/sUAS in a lab and field environment. - Provide infrastructure to collect signatures including sensors, lab, and field equipment, collection software and collection tools. - Provide a consolidated C-IED/C-sUAS library including database(s), database access, and database/library management including entry, creation and vetting of information. Analyze C-IED/C-sUAS equipment data, and create/sustain algorithms, databases and tables to monitor the creation and vetting of information. - Monitor exploitation of rotary winged, fixed winged IED/C-sUAS to manage the capability gap (from a technology and database standpoint). FY 2020 Plans: - Continue to conduct incremental capability demonstrations for an autonomous systems technology update to the Modular Autonomous Counter-WMD System B (MACS-B). - Initiate development of novel, air delivered, incendiary weapon fills for agent defeat. - Continue to develop future MACS advanced holistic payloads, specifically for hard and deeply buried targets. - Continue to provide infrastructure to collect signatures including sensors, lab and field equipment, collection software, and collection tools. - Continue to advance technical capabilities or methods to detect, locate/track, identify, characterize, monitor, assess, plan and protect against, deter, delay, disrupt, neutralize, or destroy WMD through special innovative research targeted at meeting capability gaps in CWMD. - Continue to develop and test structural reactive materials and advanced thermal agent defeat devices to improve the capability to defeat and/or neutralize CWMD-related targets. - Continue to test biocide at larger scale to analyze prompt and persistent effects, improving capability to neutralize or destroy biological weapons or agents.			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
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 2018	FY 2019	FY 2020
- Continue to develop CWMD weapon effects modeling algorithms and scaled test series leveraging machine learning and optimization for attack planning to investigate CWMD weapon effects and enhance WMD defeat modeling and simulation planning tools.												
FY 2019 to FY 2020 Increase/Decrease Statement: The increase from FY 2019 to FY 2020 is due to the realignment of Project RM-WMD Counterforce Technologies into Project RG-Counter WMD Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles. There was also decreased investment in Counter-small Unmanned Aerial Systems (C-sUAS). Real growth in this project is 0.4%.												
Accomplishments/Planned Programs Subtotals										8.483	8.959	22.253
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost	
• 28/0603160BR/RG: Counter Weapons of Mass Destruction Advanced Technology Development	40.688	20.277	235.087	-	235.087	238.668	242.425	246.630	250.582	Continuing	Continuing	
Remarks												
D. Acquisition Strategy												
Competitive selection of most appropriate performers to fulfill science and technology development needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.												
E. Performance Metrics												
Percentage of Counter WMD technologies selected for transition to Budget Activity (BA) 3, Advanced Technology Development (ATD) and BA 4, Advanced Component Development and Prototypes (ACD&P).												

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research				Project (Number/Name) RI / Nuclear Survivability			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RI: Nuclear Survivability	159.267	25.545	32.732	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	217.544

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

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

	FY 2018	FY 2019	FY 2020
Title: RI: Nuclear Survivability	25.545	32.732	-
Description: Project RI provides the capability for DoD nuclear forces and their associated control and support systems and facilities to avoid, repel, endure, or withstand attack or other hostile action, to the extent that essential functions can continue or be resumed after the onset of hostile action.			
FY 2019 Plans: - Align nuclear detonation personnel casualty output from Defense Threat Reduction Agency's (DTRA's) Health Effects from Radiological & Nuclear Environments (HENRE) for Hazard Prediction and Assessment Capability (HPAC) to the Defense Health Agency's Joint Medical Planning Tool. - Advance cold/warm x-ray and laser experimentation in order to improve nuclear survivability. For cold x-ray impulse, initiate ion beam and diagnostics development on PITHON, leading to high fluence x-rays for materials and full system impulse capability for Re-entry Vehicles/Re-entry Bodies to improve radiation survivability. Complete debris mitigation system for Double-EAGLE in			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency							Date: March 2019		
Appropriation/Budget Activity 0400 / 2				R-1 Program Element (Number/Name) PE 0602718BR / <i>*Counter Weapons of Mass Destruction Applied Research</i>			Project (Number/Name) RI / <i>Nuclear Survivability</i>		

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
support of cold x-rays for optics and thermostructural response efforts that support Missile Defense Agency (MDA) and satellite systems requirements - Translate radiation hardening basic mechanisms and physics of failure into engineering solutions to improve device and component hardening and survivability. - Update environment and protection standards on periodic five year intervals and respond to Service and Combatant Command requests for verification assessments, to include conduct of U.S. European Command/ U.S. Pacific Command Operational Plan and mission critical systems analytical assessments. - Continue development of Radiation Hardened by Design (RHBD) neutron Single Event Effects mitigation techniques for strategic radiation hardened digital complementary metal-oxide-semiconductor and Analog Mixed Signal Devices. - Develop High Altitude Electro Magnetic Pulse (HEMP), atmospheric, and disturbed environment standards; conduct verification assessments for the Services and MDA; develop technology insertions; and provide subject-matter expert support to provide combat readiness and survivability status to leadership and feedback for Military Standards validity.			
<i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> The decrease from FY 2019 to FY 2020 is due to the realignment of Project RI-Nuclear Survivability into Project RD-Nuclear Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles.			
Accomplishments/Planned Programs Subtotals	25.545	32.732	-

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 28/0603160BR/RI: <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	7.289	5.783	-	-	-	-	-	-	-	-	-
Remarks											
D. Acquisition Strategy											
Competitive selection of most appropriate performers to fulfill science and technology development needs. Performer base includes best-of-breed researchers across the DoD and other government agency laboratories, academia, industry, and international partner organizations.											
E. Performance Metrics											
Percentage of CWMD technologies selected for transition to Budget Activity (BA) 3, Advanced Technology Development (ATD) and BA 4, Advanced Component Development and Prototypes (ACD&P).											

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research				Project (Number/Name) RL / Nuclear & Radiological Effects			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RL: Nuclear & Radiological Effects	185.241	30.320	29.388	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	244.949
Note Beginning in FY 2020, efforts in this project are captured under project RD-Nuclear Technologies and Capabilities Development.												
A. Mission Description and Budget Item Justification The Nuclear and Radiological Effects project develops modeling tools to support military operational planning, weapons effects predictions, and strategic system design decisions; consolidate validated modeling tools into the Joint Information Environment for integrated functionality; predict system responses to nuclear and radiological weapons producing electromagnetic, thermal, blast, shock, and radiation environments; provide detailed adversary nuclear infrastructure characterization to enhance counterforce operations and hazard effects; and, develop foreign nuclear weapon outputs.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2018	FY 2019	FY 2020	
Title: RL: Nuclear & Radiological Effects									30.320	29.388	-	
Description: Project RL develops nuclear and radiological assessment modeling tools to support military operational planning, weapons effects predictions, and strategic system design decisions.												
FY 2019 Plans: - Develop system-generated electromagnetic pulse follow-on efforts and electromagnetic pulse coupling and response efforts to deliver high-fidelity early-time electromagnetic analysis and operational tools for US and Allied nuclear weapon effects stakeholders. - Publish updates to Weapons Output eBooks, delivering high-fidelity nuclear source terms and historical test data for use in, and validation of, modern weapon effects codes. - Develop petroleum effects models for Consequences of Execution, linking higher order impacts to Political Military Economic Social Infrastructure Information (PMESII) analyses.												
FY 2019 to FY 2020 Increase/Decrease Statement: The decrease from FY 2019 to FY 2020 is due to the realignment of Project RL-Nuclear Survivability into Project RD-Nuclear Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles.												
Accomplishments/Planned Programs Subtotals									30.320	29.388	-	

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019	
Appropriation/Budget Activity 0400 / 2				R-1 Program Element (Number/Name) PE 0602718BR / <i>*Counter Weapons of Mass Destruction Applied Research</i>				Project (Number/Name) RL / <i>Nuclear & Radiological Effects</i>			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 28/0603160BR/RL: <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	8.505	3.427	-	-	-	-	-	-	-	-	-
Remarks											
D. Acquisition Strategy											
Competitive selection of most appropriate performers to fulfill science and technology development needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.											
E. Performance Metrics											
Percentage of Counter WMD technologies selected for transition to Budget Activity (BA) 3, Advanced Technology Development (ATD) and BA 4, Advanced Component Development and Prototypes (ACD&P).											

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 2					R-1 Program Element (Number/Name) PE 0602718BR / *Counter Weapons of Mass Destruction Applied Research				Project (Number/Name) RM / WMD Counterforce Technologies			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RM: WMD Counterforce Technologies	104.355	13.956	12.780	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	131.091

Note

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

A. Mission Description and Budget Item Justification

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

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

	FY 2018	FY 2019	FY 2020
Title: RM: WMD Counterforce Technologies	13.956	12.780	-
Description: Project RM provides novel and enhanced weapons energetic materials and structures, full-scale testing of counter WMD weapon effects, weapon effects modeling, weapon delivery optimization, and technical reachback services.			
FY 2019 Plans: - Transition Hellfire-sized structural reactive material warhead technology and design to the Military services to improve capabilities to hold targets at risk. - Advance technical capabilities or methods to detect, locate/track, identify, characterize, monitor, assess, plan and protect against, deter, delay, disrupt, neutralize, or destroy WMD through special innovative research targeted at meeting capability gaps in CWMD. - Test biocide at larger scale to analyze prompt and persistent effects, improving capability to neutralize or destroy biological weapons or agents. - Develop CWMD weapon effects modeling algorithms and scaled test series leveraging machine learning and optimization for attack planning to investigate CWMD weapon effects, and enhance WMD defeat Modeling and Simulation planning tools.			
FY 2019 to FY 2020 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency								Date: March 2019	
Appropriation/Budget Activity 0400 / 2				R-1 Program Element (Number/Name) PE 0602718BR / <i>*Counter Weapons of Mass Destruction Applied Research</i>			Project (Number/Name) RM / WMD Counterforce Technologies		

B. Accomplishments/Planned Programs (\$ in Millions)				FY 2018	FY 2019	FY 2020
The decrease from FY 2019 to FY 2020 is due to the realignment of Project RM-WMD Counterforce Technologies into Project RG-Counter WMD Technologies and Capabilities as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles.						
Accomplishments/Planned Programs Subtotals				13.956	12.780	-

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 28/0603160BR/RM: <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	23.667	25.243	-	-	-	-	-	-	-	-	-
Remarks											
D. Acquisition Strategy											
Competitive selection of most appropriate performers to fulfill science and technology development needs. Performer base includes best-of-breed researchers across DoD and other government agency laboratories, academia, industry, and international partner organizations.											
E. Performance Metrics											
Percentage of CWMD technologies selected for transition to Budget Activity (BA) 3, Advanced Technology Development (ATD) and BA 4, Advanced Component Development and Prototypes (ACD&P).											

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RR: ****CWMD Test and Evaluation	86.614	12.810	14.345	17.816	-	17.816	18.156	18.451	17.775	18.131	Continuing	Continuing

Note

****Project RR title changes from Countering WMD Test and Evaluation to CWMD Test and Evaluation in FY 2020.

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)

Title: RR: Countering WMD Test and Evaluation	FY 2018	FY 2019	FY 2020
Description: Project RR provides a unique national test bed capability for the study of weapon-target interaction, simulated WMD facility characterization, and WMD facility defeat testing to evaluate the implications of WMD and other special weapon use against U.S. military and civilian assets.	12.810	14.345	17.816
FY 2019 Plans: - Develop the use of seismo-acoustic arrays as test diagnostics (both hardware and algorithms) and tools for assessing decoupling/coupling. - Continue reconstitution of instrumentation and diagnostics sensors infrastructure capabilities in support of Counter-WMD technology development projects. - Continue additional diagnostics, instrumentation, and explosives handling research in support of other testing and compliance initiatives. - Support Combatant Commands with development and testing of Chemical , Biological, Radiological, Nuclear, and High-Explosive (CBRNE) sensors and WMD countermeasures being developed to support Combatant Command requirements.			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019	
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 2018	FY 2019
- Support exercises and planning events at the Nevada Test Bed in order to develop existing defeat technologies, tools, and capabilities. Further extend testing at the Nevada National Security Site in support of the National Center for Nuclear Security portfolio's nonproliferation efforts. - Continue to design and build testbeds in small-, mid-, and large-scale environments capable of capturing data needed to improve and validate high-fidelity modeling and simulation tools used to predict weapons effects on WMD storage facilities. - Provide development, maintenance, upgrades, and testing for Autonomous Systems Test Development to support an adaptable test bed for standardized evaluation of autonomous systems in development for CWMD missions. FY 2020 Plans: - Continue to develop seismo-acoustic arrays as test diagnostics (both hardware and algorithms) and tools for assessing decoupling/coupling. - Continue reconstitution of instrumentation and diagnostics sensors infrastructure capabilities in support of CWMD technology development projects. - Continue additional diagnostics, instrumentation, and explosives handling research in support of other testing and compliance initiatives. - Continue to develop and test WMD and explosives sensors and WMD countermeasures to support Combatant Command requirements. - Continue to develop existing defeat technologies, tools, and capabilities for signature characterization in support of exercises and planning events at the Nevada Test Bed. - Continue to design and build testbeds in small-, mid-, and large-scale environments capable of capturing data needed to improve and validate high-fidelity modeling and simulation tools used to predict weapons effects on WMD storage facilities. - Continue to provide development, maintenance, upgrades, and testing for Autonomous Systems Test Development to support an adaptable test bed for standardized evaluation of autonomous systems in development for CWMD missions. - Develop the test infrastructure to test transportable system to identify signature characterization that supports existing defeat technologies, tools, and capabilities. FY 2019 to FY 2020 Increase/Decrease Statement: The increase from FY 2019 to FY 2020 is due to increased investment for test instrumentation and data acquisition systems to remain "cutting edge" in gathering test data for customers based on customer demand signals and to develop the test infrastructure to test transportable systems to identify signature characterization that supports existing defeat technologies, tools, and capabilities.			
Accomplishments/Planned Programs Subtotals		12.810	14.345
		17.816	

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602718BR / <i>*Counter Weapons of Mass Destruction Applied Research</i>	Project (Number/Name) RR / <i>****CWMD Test and Evaluation</i>	

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

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 28/0603160BR/RR: <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	0.000	12.394	-	-	-	-	-	-	-	-	-
Remarks											

D. Acquisition Strategy

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

E. Performance Metrics

Percentage of CWMD technologies selected for transition to Budget Activity (BA) 3, Advanced Technology Development (ATD) and BA 4, Advanced Component Development and Prototypes (ACD&P).

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Defense Threat Reduction Agency	Date: March 2019
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Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: Research, Development, Test & Evaluation, Defense-Wide / BA 3: Advanced Technology Development (ATD)					PE 0603134BR / Counter Improvised-Threat Simulation							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	0.000	23.366	13.648	0.000	49.528	49.528	50.110	50.250	47.887	48.194	Continuing	Continuing
JC: Enable Rapid Capability Delivery	0.000	23.366	13.648	0.000	49.528	49.528	50.110	50.250	47.887	48.194	Continuing	Continuing

Note

Overseas Contingency Operations (OCO) for Enduring Requirements (\$49.528M): OCO for Enduring Requirements are enduring in-theater and in-CONUS costs that will likely remain after combat operations cease, and have previously been funded in OCO. Funds also enable and provide for urgent and emergent warfighter requirements from Combatant Commands and Warfighter Senior Integration Group.

A. Mission Description and Budget Item Justification

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

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

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	13.648	0.000	0.000	0.000
Current President's Budget	23.366	13.648	0.000	49.528	49.528
Total Adjustments	23.366	0.000	0.000	49.528	49.528
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	23.366	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Realignment	-	-	0.000	49.528	49.528

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
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 0603134BR / <i>Counter Improvised-Threat Simulation</i>
Change Summary Explanation The increase in FY 2020 supports the continuation of Overseas Contingency Operations (OCO) at a higher level of funding than in FY 2019. FY 2020 supports increased investments in Advanced Technological Development (ATD) focused on Disruptive Technologies providing a greater than 70% solution to the following areas: Buried Improvised Explosive Devices (IED), Attack the Network, Home-Made Explosives (HME), and System Attributes across the Portfolio Range including Machine Learning & Artificial Intelligence. Strategically aligned investments include increased investments in improved autonomous capabilities supporting the detection and defeat of improvised threats and the integration of Artificial Reality (AR)/Virtual Reality (VR) into C-IT capabilities. These areas of investment continue to be identified time and again as challenging problem sets for the warfighters as identified by the CCMDs and warfighting commands in their Integrated Priority List (IPLs) and Joint Urgent Operational Need (JUON). The Continuation of ATD activities is critical to advancing current initiatives to the prototype phase in the following areas: Remote Controlled IED (RCIED) & Stand-off Detection. This investment supports further development, testing, and prototyping of advanced Modelling, Visualization, and Simulation capabilities for processor-intensive analytics to support warfighters operating in tactical environments. The capability directly supports mission planning, targeting, and post-operation analysis by troops operating in tactical theaters of operation. For example, the capability will support mission planning by providing first-person experiential mission planning through immersion in a 3-D virtual model of a target mission environment that is augmented by inputs from multiple sensor platforms. The tactical user may interact with the virtual model of the target mission environment through head-mounted and/or handheld devices. Mission planning augmented in this manner may improve targeting accuracy and provide improved force protection in tactical environments.		

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603134BR / Counter Improvised-Threat Simulation				Project (Number/Name) JC / Enable Rapid Capability Delivery			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
JC: Enable Rapid Capability Delivery	0.000	23.366	13.648	0.000	49.528	49.528	50.110	50.250	47.887	48.194	Continuing	Continuing

A. Mission Description and Budget Item Justification

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

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

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

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

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: JC: Enable Rapid Capability Delivery	23.366	13.648	0.000	49.528	49.528
Description: This project serves to understand the threat and drives a deliberate, structured, and proactive approach to identify and validate urgent or emergent capability gaps and requirements.					
FY 2019 Plans: - Improve detection capabilities through baseline threat signatures in support of sensor capability development. - Develop common database for signatures for DoD and other government agencies for use in sensor development and tactics, techniques, and procedures (TTPs). - Identify and maintain database of future threats and technologies that can be incorporated into improvised threats in support of future capability development. - Conduct testing and evaluation of future technology development in support of C-ITs. - Leverage capabilities and expertise primarily from DoD University Affiliated Research Centers (UARC)s such as Georgia Tech Research Institute (GTRI) and Massachusetts Institute of Technology (MIT) Lincoln Labs. - Convene Joint Lab Board in support of rapid development and prototyping to C-ITs.					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019				
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603134BR / Counter Improvised-Threat Simulation	Project (Number/Name) JC / Enable Rapid Capability Delivery				
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Conduct Hacking 4 Defense in support of rapid development and prototyping to C-ITs. - Develop Broad Area Announcement (BAA) solicitation in support of capabilities to C-ITs. FY 2020 Base Plans: N/A FY 2020 OCO Plans: - Improve detection capabilities through baseline threat signatures for vehicles, explosives, and other threats in support of sensor capability development. - Develop common database for signatures for DoD and other government agencies to use for sensor development and tactics, techniques, and procedures (TTPs). - Identify and maintain database of future threats and technologies that can be incorporated into improvised threats in support of future capability development. - Conduct testing and evaluation of future technology development in support of C-ITs. - Increase the processing, exploitation, and dissemination of data for integrated sensors identifying improvised threat facilitation networks. - Enhance integration of sensors identifying improvised threat facilitation networks. - Create new capabilities related to next generation cellular technology. - Improve sensor integration capability for Person Borne Improvised Explosive Device (PBIED) and Vehicle Borne Improvised Explosive Device (VBIED) to improve detection rates and increase standoff detection. - Investigate incorporation of Machine Learning (ML) and Artificial Intelligence (AI) into C-IT capabilities. - Improve autonomous capabilities that support the detection and defeat of improvised threats in support of non-line of sight missions. - Integrate Artificial Reality (AR)/Virtual Reality (VR) into C-IT capabilities. - Conduct Hacking 4 Defense in support of rapid development and prototyping to C-ITs. - Develop Broad Area Announcement (BAA) solicitation in support of capabilities to C-ITs. FY 2019 to FY 2020 Increase/Decrease Statement: DTRA increased investment for activities at the Technology Readiness Level (TRL) 5 to enable DoD to deliver the most technologically advanced response to improvised threats: Component and/or breadboard validation in a relevant environment or TRL 6: System/subsystem model or prototype demonstration in a relevant environment. DTRA also increased investment in ML and AI C-IT capabilities, to improve autonomous							

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019		
Appropriation/Budget Activity 0400 / 3		R-1 Program Element (Number/Name) PE 0603134BR / <i>Counter Improvised-Threat Simulation</i>		Project (Number/Name) JC / <i>Enable Rapid Capability Delivery</i>	

B. Accomplishments/Planned Programs (\$ in Millions)				FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
capabilities that support the detection and defeat of improvised threats in support of non-line of sight missions, and the integration of Artificial Reality (AR)/Virtual Reality (VR) into C-IT capabilities.								
Accomplishments/Planned Programs Subtotals				23.366	13.648	0.000	49.528	49.528

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

<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020 Base</u>	<u>FY 2020 OCO</u>	<u>FY 2020 Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• 10/0602134BR/JC: <i>Improvised Threat Reduction Applied Research</i>	0.000	0.000	0.000	0.502	0.502	0.512	0.522	0.533	0.543	Continuing	Continuing
• 94/0604134BR/JC: <i>Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing</i>	117.640	148.772	0.000	103.793	103.793	59.860	109.236	105.258	106.598	Continuing	Continuing

Remarks

D. Acquisition Strategy

Select the best performer through studies and development boards with products that can be quickly assessed and placed into development in order to produce a product valuable to the warfighter in combating improvise threat effectiveness.

E. Performance Metrics

Completing projects within a 24 month period for use by the warfighter, and transfer to the services, agencies, or organizations.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Defense Threat Reduction Agency	Date: March 2019
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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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	1,957.505	292.846	280.858	340.065	-	340.065	333.624	336.004	344.360	349.004	Continuing	Continuing
RA: <i>*CWMD Cross-Cutting Technical and Information Sciences</i>	51.128	17.732	11.286	34.825	-	34.825	30.722	32.739	35.660	37.254	Continuing	Continuing
RD: <i>**Nuclear Technologies and Capabilities Development</i>	43.023	21.923	26.021	70.153	-	70.153	64.234	60.840	62.070	61.168	Continuing	Continuing
RE: <i>Counter-Terrorism Technologies</i>	757.112	101.737	108.978	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	967.827
RF: <i>Forensics Technologies</i>	433.928	25.535	33.578	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	493.041
RG: <i>***Counter WMD Technologies and Capabilities Development</i>	134.888	40.688	20.277	235.087	-	235.087	238.668	242.425	246.630	250.582	Continuing	Continuing
RI: <i>Nuclear Survivability</i>	50.493	7.289	5.783	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	63.565
RL: <i>Nuclear & Radiological Effects</i>	3.390	8.505	3.427	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.322
RM: <i>WMD Counterforce Technologies</i>	173.550	23.667	25.243	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	222.460
RR: <i>CWMD Test and Evaluation</i>	16.052	0.000	12.394	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	28.446
RT: <i>Target Assessment Technologies</i>	293.941	45.770	33.871	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	373.582

Note

In program element 0603160BR, Defense Threat Reduction Agency's (DTRA) consolidated projects RF-Forensics Technologies, RI-Nuclear Survivability, and RL-Nuclear and Radiological Effects into the renamed RD-Nuclear Technologies and Capabilities Development beginning in FY 2020. 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.

*Project RA title changes from Information Sciences and Applications to CWMD Cross-Cutting Technical and Information Sciences in FY 2020.

**Project RD title changes from Detection Technologies to Nuclear Technologies and Capabilities Development in FY 2020.

***Project RG title changes from Defeat Technologies to Counter WMD Technologies and Capabilities Development in FY 2020.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Defense Threat Reduction Agency	Date: March 2019
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I</i> BA 3: <i>Advanced Technology Development (ATD)</i>	R-1 Program Element (Number/Name) PE 0603160BR I <i>*Counter Weapons of Mass Destruction Advanced Technology Development</i>
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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 which is established annually by DTRA. The objectives directly support policy and planning guidance from the Office of the President, the Department of Defense (DoD), and the broader WMD threat reduction community.

The portfolio advances the Countering Weapons of Mass Destruction (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.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020 Base</u>	<u>FY 2020 OCO</u>	<u>FY 2020 Total</u>
Previous President's Budget	268.607	299.858	278.093	-	278.093
Current President's Budget	292.846	280.858	340.065	-	340.065
Total Adjustments	24.239	-19.000	61.972	-	61.972
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-29.000			
• Congressional Rescissions	-	-			
• Congressional Adds	30.000	10.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-5.761	-			
• Realignments	-	-	61.972	-	61.972

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

Project: RG: ****Counter WMD Technologies and Capabilities Development*

Congressional Add: *Target Sensing Technologies*

	<u>FY 2018</u>	<u>FY 2019</u>
	10.000	10.000
Congressional Add Subtotals for Project: RG	10.000	10.000
Congressional Add Totals for all Projects	10.000	10.000

Change Summary Explanation

The increase in FY 2020 from the previous President's Budget submission is due to increased investment for the improvement of technical reachback capacity to grow operational support as current demand outpaces capacity, quick reaction capabilities to rapidly transition both material and non-material solutions to

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	
0400: Research, Development, Test & Evaluation, Defense-Wide I BA 3: Advanced Technology Development (ATD)	PE 0603160BR I *Counter Weapons of Mass Destruction Advanced Technology Development	
the field, increased investment in the development of classified and unclassified United States Central Command (USCENTCOM) and United States Special Operations Command (USSOCOM) efforts to counter threat networks by assessing, identifying, and providing capabilities to maintain technological superiority, the development of technological applications to operate in a nuclear contaminated environment, and development of battlefield tools necessary to support time-sensitive decision-making during nuclear warfare. There is 20% real growth in this program element from the previous President's Budget submission.		

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RA: *CWMD Cross-Cutting Technical and Information Sciences	51.128	17.732	11.286	34.825	-	34.825	30.722	32.739	35.660	37.254	Continuing	Continuing

Note

*Project RA title changes from Information Sciences and Applications to CWMD Cross-Cutting Technical and Information Sciences in FY 2020.

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)

	FY 2018	FY 2019	FY 2020
Title: RA: CWMD Cross-Cutting Technical and Information Sciences	17.732	11.286	34.825
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 2019 Plans: - Continue to provide tailored support to DoD with 24/7 technical reachback via processes, capabilities, and expertise in CBRNE. Leverage this support for partner stakeholders, providing scientific modeling support to Department of Health and Human Services and serving as the Federal Emergency Management Agency's Interagency Modeling and Atmospheric Assessment Center (IMAAC) Technical Operations Hub. - Research and develop capabilities to predict/simulate Higher Order Effects, including spread of infectious disease and protection from WMD, and other required capabilities to support U.S. Strategic Command (USSTRATCOM).			
FY 2020 Plans: - Develop a robust quick reaction 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.			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
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 2018	FY 2019	FY 2020
- 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 IMAAC Technical Operations Hub. - Continue to develop capabilities in support of USSTRATCOM and United 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. <i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> The increase from FY 2019 to FY 2020 is due to increased investment for the improvement of technical reachback capacity to grow operational support in technical reachback as current demand outpaces capacity. This is a critical resource that provides 24/7 support to CCMDs, fulfilling direct warfighter requests. Additionally, increased investment supports the quick reaction capability to rapidly transition both material and non-material developmental capabilities to fielded solutions, enhancing DTRA's ability to meet emergent needs that require short order response by providing the acquisition innovation tools, operational and acquisition experts, and flexible contract solutions designed to speed capability to the warfighter.			
Accomplishments/Planned Programs Subtotals	17.732	11.286	34.825

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

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 20/0602718BR/RA: <i>Counter Weapons of Mass Destruction Applied Research</i>	40.189	30.603	46.317	-	46.317	48.032	49.312	49.896	58.703	Continuing	Continuing
• 105/0604775BR/RA: <i>Advanced Component Development and Prototypes</i>	0.000	0.000	14.021	0.000	14.021	12.564	6.800	6.800	6.700	Continuing	Continuing
• 159/0605502BR/RA: <i>Small Business Innovation Research</i>	11.311	-	-	-	-	-	-	-	-	Continuing	Continuing

Remarks

D. Acquisition Strategy

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

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
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>

E. Performance Metrics

Number of successful assessments resulting from technical reachback responses. Percentage of completed demonstration programs transitioning each year.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603160BR / *Counter Weapons of Mass Destruction Advanced Technology Development				Project (Number/Name) RD / **Nuclear Technologies and Capabilities Development			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RD: **Nuclear Technologies and Capabilities Development	43.023	21.923	26.021	70.153	-	70.153	64.234	60.840	62.070	61.168	Continuing	Continuing

Note

In program element 0603160BR, Defense Threat Reduction Agency's (DTRA) consolidated projects RF-Forensics Technologies, RI-Nuclear Survivability, and RL-Nuclear and Radiological Effects into the renamed RD-Nuclear Technologies and Capabilities Development beginning in FY 2020. There is zero real growth in this project.

****Project RD title changes from Detection Technologies to Nuclear Technologies and Capabilities Development in FY 2020.**

A. Mission Description and Budget Item Justification

1. Research, development, test, and evaluation 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 DoD requirements for countering terrorism, counterproliferation, nonproliferation, countering rogue states, and homeland defense.
2. Research, development, test, and evaluation (RDT&E) to systematically study signatures associated with adversary nuclear programs and nuclear detonations gain knowledge or understanding necessary to determine technical capabilities needed to improve Department of Defense (DoD) contingency planning activities; gain knowledge or understanding necessary to improve DoD situational awareness on the nuclear battlefield; gain knowledge or understanding necessary to improve capabilities to attribute the source of a nuclear.
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 Department of Defense 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 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.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019		
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / *Counter Weapons of Mass Destruction Advanced Technology Development	Project (Number/Name) RD / **Nuclear Technologies and Capabilities Development		
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.				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
Title: RD: Nuclear Technologies and Capabilities Development		21.923	26.021	70.153
Description: Project RD develops, integrates and transitions radiation detection technologies, as well as systems, tools, techniques, and procedures that take advantage of non-radiation based signatures, in order to advance warfighter capabilities to rapidly detect, localize, characterize, and interdict nuclear and radiological threats.				
FY 2019 Plans:				
- Test the Modular Airborne Gaseous Isotope Collection System (MAGICS) gas collection system in the field in support of closer, sooner, site-specific monitoring. Novel technologies are necessary to conduct gas monitoring in support of nuclear detection missions, as timing, signature strength and complex analysis present challenges.				
- Develop unattended sensor networks for autonomous detection and analysis.				
- Catalog relevant seismic signatures, and develop algorithms for signature detection.				
- Continue to conduct targeted research on component-level technologies, such as low-power electronics, solid-state photodetectors, search and ID algorithms, and helium-3 replacement technologies, which will improve existing detection technology subsystem components.				
- Develop and integrate nuclear and radiological signature collections into new sensor systems.				
- Further the development of nuclear threat analysis algorithms to be implemented in existing systems in order to increase accuracy and reduce processing time.				
- Demonstrate, test, and transition systems that remotely monitor nuclear and radiological threat signatures in small and wide areas.				
- Improve the setup, maintenance, and peer-to-peer collaboration provided by systems shared among nuclear and radiological search teams.				
- Test and evaluate new radiation detection technologies in order to validate capabilities, improve prototypes, and provide required performance data to support follow-on development.				
- Improve capabilities to effectively monitor and control networked systems of sensors, and expand the use of augmented reality to increase situational awareness.				
- Improve low-visibility, high-precision gamma spectroscopy, particularly for indoor or concealed operation.				
- Develop and integrate nuclear and radiological signature collections into new sensor systems.				

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019	
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 2018	FY 2019
- Further the development of nuclear threat analysis algorithms to be implemented in existing systems in order to increase accuracy and reduce processing time. - Demonstrate, test, and transition systems that remotely monitor nuclear and radiological threat signatures in small and wide areas. - Improve the setup, maintenance, and peer-to-peer collaboration provided by systems shared among nuclear and radiological search teams. - Test and evaluate new radiation detection technologies in order to validate capabilities, improve prototypes, and provide required performance data to support follow-on development. - Develop new capabilities to emplace detectors into previously denied areas. - Improve capabilities to effectively monitor and control networked systems of sensors, and expand the use of augmented reality to increase situational awareness. FY 2020 Plans: - Improve DoD decision-making by adapting, integrating, and conducting field test of nuclear sensor capabilities to quickly characterize nuclear events (e.g. tests, explosions on the battlefield) in order to inform tactical, operational, and strategic military action. - Develop and test techniques to improve the ability of nuclear modeling codes to support tactical DoD operations. - Develop and improve nuclear technologies for application to DoD, international, and other government agency missions. - Develop, integrate and field test technologies and techniques for “field analysis of nuclear event to provide rapid answers in support of nuclear threat, attribution processes, and counterproliferation activities, and improved situational awareness on the nuclear battlefield in order to inform tactical and strategic military action. - Continue to test and develop MAGICS gas collection system in the field in support of closer, sooner, site-specific monitoring. Novel technologies are necessary to conduct gas monitoring in support of nuclear detection missions, as timing, signature strength and complex analysis present challenges. - Continue to 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. - Continue to develop, demonstrate, test, and transition systems that remotely monitor nuclear and radiological threat signatures in small and wide areas.			
			FY 2020

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019
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 2018	FY 2019	FY 2020
- Continue to lead a DoD and interagency, end-to-end nuclear technology demonstration and evaluation of DTRA-developed technologies/methodologies to assess NTNF process improvements and identify potential capability gaps in confidence, timeliness, and accuracy, and assist in assessing contribution to interagency attribution process and decisions. - Continue to develop new or update existing standards and handbooks to capture critical information for DoD to verify and validate mission critical systems. - Continue to develop and collaborate on Satellite System Natural and Nuclear Environment Protection Standard with DoD Stakeholders and the DoD Standardization Program Office. - Continue producing technical reports addressing DoD radiogenic disease concerns; which address Congressional interest in historical veteran radiation exposure and present day radiological exposures of the DoD-affiliated population. - Continue to 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. - Continue to develop natural gas and water/seawater effects models in support of USSTRATCOM Consequences of Execution efforts, linking higher order effects to PMESII analyses. - Continue to integrate, demonstrate, and deliver a suite of consistent and enhanced models, tools, references, and data to US and Allied nuclear weapon effects stakeholders. <i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> The increase from FY 2019 to FY 2020 is due to the realignment of Projects RF-Forensics Technology, RI-Nuclear Survivability, and RL-Nuclear and Radiological Effects into Project RD-Nuclear Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles. Real growth in this project is zero.			
Accomplishments/Planned Programs Subtotals	21.923	26.021	70.153

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

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 20/0602718BR/RD: <i>Counter Weapons of Mass Destruction Applied Research</i>	13.745	16.860	92.710	-	92.710	93.612	95.541	97.485	99.433	Continuing	Continuing
• 127/0605000BR/RD: <i>*Counter Weapons of Mass Destruction Systems Development</i>	-	-	7.500	-	7.500	7.650	7.803	7.959	8.118	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency							Date: March 2019		
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>		

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

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Remarks											

D. Acquisition Strategy

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

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603160BR / *Counter Weapons of Mass Destruction Advanced Technology Development				Project (Number/Name) RE / Counter-Terrorism Technologies			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RE: Counter-Terrorism Technologies	757.112	101.737	108.978	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	967.827

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 is a collaborative effort to develop advanced, warfighter-unique technologies to defeat terrorist WMD development/acquisition pathways, to include defeat of the devices themselves, while minimizing risks to U.S. forces; (2) USSOCOM CWMD-T Support develops concepts and technologies to integrate and synchronize operations and activities that prevent terrorists and rogue nation states from developing, acquiring, proliferating, or using WMD. This effort supports Commander, USSOCOM responsibilities under the Chairman, Joint Chiefs of Staff Unified Command Plan.

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

Title: RE: Counter-Terrorism Technologies	FY 2018	FY 2019	FY 2020
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.	101.737	108.978	-
FY 2019 Plans: - Continue to develop offensive counterproliferation, counter-WMD technologies in support of combatant command requirements. - Continue development of WMD and pathway defeat technologies, as well as threat-specific test articles and analyses necessary to support the modeling archive used to support such developmental efforts. - Continue to develop lighter, smaller, more effective breaching capabilities. - Continue to develop next generation WMD detection technology applications. - Deploy Analyzer for Wide-Area Restoration Effectiveness (AWARE) V1.0 in Dynamic Picture of the Operating Environment (DPOE) 4.0, the next generation of DPOE that will incorporate research advances in High Performance Computing (HPC), analytics, and natural language processing. AWARE v1.0 will improve users' ability to identify emerging threat entities with existing personnel resources and reduce missed opportunities.			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
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) RE / <i>Counter-Terrorism Technologies</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
- Integrate HPC software tools into DPOE, leveraging capabilities of high performance computing to improve automated analytics to more accurately or quickly identify events, actors and threats.			
<i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> The decrease from FY 2019 to FY 2020 is due to the realignment of Project RE-Counter-Terrorism Technologies into Project RG-Counter WMD Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles.			
Accomplishments/Planned Programs Subtotals	101.737	108.978	-

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

<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u> <u>Base</u>	<u>FY 2020</u> <u>OCO</u>	<u>FY 2020</u> <u>Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 20/0602718BR/RE: <i>Counter Weapons of Mass Destruction Applied Research</i>	0.693	-	-	-	-	-	-	-	-	Continuing	Continuing

Remarks

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

D. Acquisition Strategy

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

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
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>			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RF: <i>Forensics Technologies</i>	433.928	25.535	33.578	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	493.041

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; (3) nuclear forensic materials exploitation for attribution.

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

Title: RF: Forensics Technologies		FY 2018	FY 2019	FY 2020
Description: Project RF supports nuclear forensics by developing: (1) technologies, systems and procedures for post detonation nuclear forensics; (2) on/off-site analysis to meet forensic, verification, monitoring and confidence-building requirements; (3) technologies to detect, locate, identify, track, and interdict nuclear and radiological threats, including enablers to their acquisition and development.		25.535	33.578	-
FY 2019 Plans: - Lead a DoD and interagency, end-to-end nuclear forensics process technology demonstration and evaluation of DTRA-developed technologies/methodologies to assess NTNF process improvements and identify potential capability gaps in forensic conclusion confidence, timeliness, and accuracy, and assist in assessing contribution to interagency attribution process and decisions. - Demonstrate 50% decrease in the material nuclear forensics fixed lab process timeline, with increased confidence and decreased technical uncertainties, improving capacity to make conclusions with low uncertainty and high confidence in a relevant timeframe.				

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
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>

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

	FY 2018	FY 2019	FY 2020
- Support Discreet Oculus ground-based prompt diagnostics sensor system in support of transfer/transition to USAF U.S. Prompt Diagnostics System (USPDS) program of record. - Complete design, build and installation of regional array, in preparation for transition of array to partner organization. - Modify Forensics Inversion Tool Suite (FITS) and Design Signature Database (DSD) forensic tools to better meet stakeholder needs for forensic devices. Los Alamos National Lab FITS tool modifications are being done in conjunction with the Stockpile program. - Prepare to transition recently developed device assessment research and development capabilities to partners at the National Nuclear Security Administration. <i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> The decrease from FY 2019 to FY 2020 is due to the realignment of Project RF-Forensics Technologies into Project RD-Nuclear Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles.			
Accomplishments/Planned Programs Subtotals	25.535	33.578	-

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

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 20/0602718BR/RF: <i>Counter Weapons of Mass Destruction Applied Research</i>	6.803	10.257	-	-	-	-	-	-	-	-	-
• 127/0605000BR/RF: <i>Counter Weapons of Mass Destruction Systems Development</i>	6.199	6.163	-	-	-	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

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

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603160BR / *Counter Weapons of Mass Destruction Advanced Technology Development				Project (Number/Name) RG / ***Counter WMD Technologies and Capabilities Development			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RG: ***Counter WMD Technologies and Capabilities Development	134.888	40.688	20.277	235.087	-	235.087	238.668	242.425	246.630	250.582	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. There is 15.1% real growth in this project.

***Project RG title changes from Defeat Technologies to Counter WMD Technologies and Capabilities Development in FY 2020.

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; (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.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
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>
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) The 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; (3) innovative engineering of select promising technologies discovered under fundamental and basic 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) 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 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)		
Title: RG: Counter WMD Technologies and Capabilities Development		FY 2018
Description: Project RG develops advanced technologies and weapon concepts and validates their applicability to CWMD.		FY 2019
FY 2019 Plans:		FY 2020
- Complete full scale development and testing of Agent Defeat Penetrator weapon in preparation for its consideration in a United States Air Force (USAF) analysis of alternatives. - Continue full scale prototype demonstration of novel access denial technology in an operational environment. - Build-out prototype of second version of autonomous system and demonstrate system and payload in a relevant environment. - Collect signatures on IED/sUAS in a predictive environments using modeling & simulation. - Provide advanced infrastructure to improve collection of signatures including sensors, lab and field equipment, collection software, and collection tools.		

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019	
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 2018	FY 2019
- Provide advanced IED/sUAS library analytics to improve database management (including entry, creation of information and vetting of information), search functionality, and 3rd party database queries. - Provide curation, dissemination, and access to collected data. - Develop and establish standardized data collection protocols. - Build, procure, and validate advanced and improvised threats to assist in threat risk analysis. - Develop IED/sUAS Identify Friend or Foe (IFF) low cost solutions to support U.S. forces and improve sensor detection while decreasing false alarm rates and reporting. - Identify and develop passive threat detections for IED/sUAS systems as the technology continues to develop in private industry. - Develop counter-measures to detect and defeat multi-agent enemy IED/sUAS. - Develop acoustic disrupters to defeat enemy IED/sUAS. - Improve sensor integration of C-IED/C-sUAS systems to improve detection and defeat capabilities and reduce the human in the loop. - Develop capability for manned aircraft to detect IED/sUAS in order to protect manned aircraft from potential threat IED/sUAS effects. - Provide Testing site/location, personnel and Data collection/Analysis and Test reporting for DTRA Counter-Small Unmanned Aircraft Unmanned Aerial Systems (C-sUAS) Defeat One (CD-I) testing event. This test event is formerly known as Hard Kill II which also took place at White Sands Missile Range (WSMR), MNNM. - Provide RED Team personnel oversight for UAS threat device operations during test scenarios. Inventory and maintain threat UAS documentation and ensure accurate records are maintained as required. - Coordinate and maintain Vendor and Visitor personnel roster, range access request, safety briefings and communications plan as required during the duration of CD-I. FY 2020 Plans: - Finalize full scale testing of the Agent Defeat Penetrator fill. - Continue full-scale prototype demonstration of novel access denial technology in an operational environment. - Continue to develop offensive counterproliferation, counter-WMD technologies in support of combatant command requirements. - Continue to develop WMD pathway defeat technologies, as well as threat-specific test articles and analyses. - Continue to develop lighter, smaller, more effective breaching capabilities. - Continue to develop next generation WMD detection technology applications. - Continue to integrate HPC software tools into Dynamic Picture of the Operating Environment (DPOE), leveraging capabilities of high performance computing to improve automated analytics to more accurately or quickly identify events, actors and threats. - 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.			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019		
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 2018	FY 2019	FY 2020
- 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. - Continue to 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. - Continue to 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. - Continue to develop enhancements to the Integrated Munitions Effects Assessment modeling and simulation planning tool. - Continue support for Combatant Command exercises and planning events at the Nevada Test Bed to develop target defeat technologies, tools, and capabilities. - Continue to 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 CCMD and IC WMD and HDBT characterization and defeat requirements. - Continue to 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. - Continue cooperative CWMD project technical exchange with the United Kingdom (UK) in support of US/UK Project Agreement. - Continue Coalition Warfare Program Agreement with Republic of Korea for advancement of autonomous tunnel exploitation technologies. - Continue to develop complex geotechnical models for support of geotechnical site characterization of WMDhard target sites. - Continue to develop enhancements to WMDpedia for DPOE and the Sensitive Site Exploitation mobile application. - Continue to assess and develop analytic capabilities to enhance the warfighter's ability to conduct predictive analysis and forecast potential WMD threats informing future CWMD requirements. <i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> The increase from FY 2019 to FY 2020 is due to the realignment of Project RE-Counter Terrorism Technologies, Project RM-WMD Counterforce Technologies, Project RR-CWMD Test and Evaluation, and Project RT-Target Assessment Technologies into Project RG-Counter WMD Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles.				

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603160BR / *Counter Weapons of Mass Destruction Advanced Technology Development	Project (Number/Name) RG / ***Counter WMD Technologies and Capabilities Development	

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

	FY 2018	FY 2019	FY 2020
Additionally, DTRA increased investment in the development of classified and unclassified USCENTCOM and USSOCOM efforts to counter threat networks by assessing, identifying, and providing capabilities to maintain technological superiority. Real growth in this project is 15.1%.			
Accomplishments/Planned Programs Subtotals	30.688	10.277	235.087

	FY 2018	FY 2019
Congressional Add: Target Sensing Technologies	10.000	10.000
FY 2018 Accomplishments: - Completed software spiral development for five prototypes for target sensing technologies. Details classified. - Completed algorithm development and integration with mission performance capabilities, resulting in software configuration control board system recommendations and analysis. Details classified. - Initiated development and fabrication of additional prototype systems. Details classified.		
FY 2019 Plans: - Funds pre-award requirement for follow-on contract vehicle for transition of program and systems development to Service/Warfighter. Procurement sensitive. - Purchases up to 20 test prototypes systems in existing and new form factors for target sensing technologies. Details classified. - Funds further development of additional algorithm development and integration with mission performance capabilities, resulting in software configuration control board system recommendations and analysis. Details classified.		
Congressional Adds Subtotals	10.000	10.000

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

<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u> <u>Base</u>	<u>FY 2020</u> <u>OCO</u>	<u>FY 2020</u> <u>Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 20/0602718BR/RG: Counter Weapons of Mass Destruction Applied Research	8.483	8.959	22.253	-	22.253	22.958	22.919	23.715	24.190	Continuing	Continuing
Remarks											

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
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>

D. Acquisition Strategy

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

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
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>			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RI: <i>Nuclear Survivability</i>	50.493	7.289	5.783	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	63.565

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 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 2018	FY 2019	FY 2020
Title: RI: Nuclear Survivability	7.289	5.783	-
Description: Project RI develops, integrates, and transitions novel technologies that radically enhance the survivability and resilience of DoD nuclear forces and their associated control and support systems in the event of an attack or other hostile action.			
FY 2019 Plans:			
- Produce appropriate new or updated standards and handbooks to capture critical information for DoD to verify and validate mission critical systems.			
- Coordinate Satellite System Natural and Nuclear Environment Protection Standard with DoD Stakeholders and the DoD Standardization Program Office.			
- Continue producing technical reports addressing DoD radiogenic disease concerns; which address Congressional interest in historical veteran radiation exposure and present day radiological exposures of the DoD-affiliated population.			
- Evaluate Commercial Off the Shelf (COTS) radiation-hardened microelectronics from trusted, commercial sources.			
- Conduct research to characterize radiation-hardened materials and determine viability for inclusion in DOD systems.			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
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>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
- Final independent verification and validation (IV&V) of DIAMONDS coding and data prior to migration to DIAMONDS Next Generation. - Codify the Information Assurance and Accreditation documentation for the transition from Defense Integration and Management of Nuclear Data Services (DIAMONDS) to DIAMONDS Next Generation. Provide supporting documentation to DISA for DIAMONDS cloud operation in support of Federal Data Center Consolidation Initiative. - Commence concurrent DIAMONDS and DIAMONDS Next Generation testing for functional and data validation. <i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> The decrease from FY 2019 to FY 2020 is due to the realignment of Project RI-Nuclear Survivability into Project RD-Nuclear Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles.			
Accomplishments/Planned Programs Subtotals	7.289	5.783	-

C. Other Program Funding Summary (\$ in Millions)										
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete Total Cost
• 20/0602718BR/RI: <i>Counter Weapons of Mass Destruction Applied Research</i>	25.545	32.732	-	-	-	-	-	-	-	-

Remarks

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

E. Performance Metrics
Percentage of completed demonstration programs transitioning each year.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603160BR / *Counter Weapons of Mass Destruction Advanced Technology Development				Project (Number/Name) RL / Nuclear & Radiological Effects			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RL: Nuclear & Radiological Effects	3.390	8.505	3.427	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.322
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 2018	FY 2019	FY 2020	
Title: RL: Nuclear and Radiological Effects									8.505	3.427	-	
Description: Project RL develops nuclear and radiological assessment modeling tools to support military operational planning, weapons effects predictions, and strategic system design decisions.												
FY 2019 Plans: - Develop natural gas and water/seawater effects models in support of U.S. Strategic Command (USSTRATCOM) Consequences of Execution (COE) efforts, linking higher order effects to PMESII analyses. - Integrate, demonstrate, and deliver a suite of consistent and enhanced models, tools, references, and data to US and Allied nuclear weapon effects stakeholders.												
FY 2019 to FY 2020 Increase/Decrease Statement: The decrease from FY 2019 to FY 2020 is due to the realignment of Project RL-Nuclear and Radiological Effects into Project RD-Nuclear Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles.												
Accomplishments/Planned Programs Subtotals									8.505	3.427	-	

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019
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 2018</u>	<u>FY 2019</u>	<u>FY 2020</u> <u>Base</u>	<u>FY 2020</u> <u>OCO</u>	<u>FY 2020</u> <u>Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 20/0602718BR/RL: <i>Counter Weapons of Mass Destruction Applied Research</i>	30.320	29.388	-	-	-	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603160BR / *Counter Weapons of Mass Destruction Advanced Technology Development				Project (Number/Name) RM / WMD Counterforce Technologies			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RM: WMD Counterforce Technologies	173.550	23.667	25.243	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	222.460
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. (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 2018	FY 2019	FY 2020	
Title: RM: WMD Counterforce Technologies									23.667	25.243	-	
Description: Project RM provides: (1) full-scale testing of CWMD weapons effects, weapon effects modeling, and weapon delivery system optimization; and (2) WMD sensor, surveillance, and data processing technologies.												
FY 2019 Plans: - Complete Chemical Intelligence, Surveillance, and Reconnaissance (ISR) area search mission planning tool proof of concept to enhance capabilities to search for, detect, and identify chemical threats prior to release. - Transition the Loop-mediated isothermal Amplification (LAMP), the Biological ISR Sample Collection (SCOUT), and the Sampling Capability Improvement Project (SCIP) to the Joint Program Executive Office – Chemical and Biological Defense (JPEO-CBD) in support of Biological ISR sample collection capability improvements. - Conduct mission-oriented experiments to model, simulate, analyze, or exploit technical capabilities intended to counter WMD or mitigate risks and impacts to critical assets in operationally relevant conditions.												

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
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 / WMD Counterforce Technologies

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

	FY 2018	FY 2019	FY 2020
- Release updated version of modernized, fast-running, validated Integrated Munitions Effects Assessment, a CWMD modeling and simulation (M&S) planning tool, incorporating near-miss lethality, weapons data, and concrete modeling, to optimize the execution of WMD and associated hard target defeat operations.			
<i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> The decrease from FY 2019 to FY 2020 is due to the realignment of Project RM into Project RG-Counter WMD Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles.			
Accomplishments/Planned Programs Subtotals	23.667	25.243	-

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

<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u> <u>Base</u>	<u>FY 2020</u> <u>OCO</u>	<u>FY 2020</u> <u>Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 20/0602718BR/RM: <i>Counter Weapons of Mass Destruction Applied Research</i>	13.956	12.780	-	-	-	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

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

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603160BR / *Counter Weapons of Mass Destruction Advanced Technology Development				Project (Number/Name) RR / CWMD Test and Evaluation			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RR: CWMD Test and Evaluation	16.052	0.000	12.394	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	28.446

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

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

	FY 2018	FY 2019	FY 2020
Title: RR: Countering WMD Test and Evaluation	0.000	12.394	-
Description: Project RR provides a unique national test bed capability for simulated WMD facility characterization, weapon-target interaction, and WMD facility defeat testing.			
FY 2019 Plans: - Continue support for Combatant Command exercises and planning events at the Nevada Test Bed in order to develop target defeat technologies, tools, and capabilities. - Maintain and further develop interagency capabilities and special tests in support of national priority programs and mission requirements. - Support the planning, execution, and analysis of two major CWMD test and demonstration events at the Nevada National Security Site or other locations within or outside the continental U.S.			
FY 2019 to FY 2020 Increase/Decrease Statement: The decrease from FY 2019 to FY 2020 is due to the realignment of Project RR-Countering WMD Test and Evaluation into Project RG-Counter WMD Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles.			
Accomplishments/Planned Programs Subtotals	0.000	12.394	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019
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) RR / <i>CWMD Test and Evaluation</i>	

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

<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u> <u>Base</u>	<u>FY 2020</u> <u>OCO</u>	<u>FY 2020</u> <u>Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 20/0602718BR/RR: <i>Counter Weapons of Mass Destruction Applied Research</i>	12.810	14.345	17.816	-	17.816	18.156	18.451	17.775	18.131	Continuing	Continuing

Remarks

D. Acquisition Strategy

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

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 3					R-1 Program Element (Number/Name) PE 0603160BR / *Counter Weapons of Mass Destruction Advanced Technology Development				Project (Number/Name) RT / Target Assessment Technologies			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RT: Target Assessment Technologies	293.941	45.770	33.871	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	373.582

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

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

	FY 2018	FY 2019	FY 2020
Title: RT: Target Assessment Technologies	45.770	33.871	-
Description: Project RT provides CCMDs and the IC with technologies and processes to find and characterize WMD targets and hard and deeply buried targets and then assess the results of attacks against those targets.			
FY 2019 Plans: - Complete engineering rule-based development for automated advanced targeting characterization efforts to meet CCMD and IC WMD and HDBT characterization and defeat requirements. - Further develop the Functional Defeat Enterprise process including identifying facility functions, determining defeat vulnerabilities in support of attack planning and execution, and determining new battle damage information methods. - Develop cooperative CWMD project technical exchange with the United Kingdom (UK) in support of a U.S./UK Project Agreement. - Continue to develop complex geotechnical models for support of geotechnical site characterization of WMD target sites.			
FY 2019 to FY 2020 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
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>

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

The decrease from FY 2019 to FY 2020 is due to the realignment of Project RR-Target Assessment Technologies into Project RG-Counter WMD Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles.

	FY 2018	FY 2019	FY 2020
Accomplishments/Planned Programs Subtotals	45.770	33.871	-

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

N/A

Remarks

D. Acquisition Strategy

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

E. Performance Metrics

Percentage of completed demonstration programs transitioning each year.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Defense Threat Reduction Agency	Date: March 2019
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	PE 0604134BR I <i>Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing</i>											
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	0.000	144.934	169.638	0.000	113.590	113.590	69.950	119.522	115.843	117.485	Continuing	Continuing
JC: <i>Enable Rapid Capability Delivery</i>	0.000	117.640	148.772	0.000	103.793	103.793	59.860	109.236	105.258	106.598	Continuing	Continuing
JR: <i>Enable DoD Responsiveness</i>	0.000	9.790	7.725	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	17.515
JS: <i>Assist Situational Understanding</i>	0.000	17.504	13.141	0.000	9.797	9.797	10.090	10.286	10.585	10.887	Continuing	Continuing

Note

Overseas Contingency Operations (OCO) for Enduring Requirements (\$113.590): OCO for Enduring Requirements are enduring in-theater and in-CONUS costs that will likely remain after combat operations cease, and have previously been funded in OCO. Funds also enable and provide for urgent and emergent warfighter requirements from CCMDs and Warfighter Senior Integration Group.

A. Mission Description and Budget Item Justification

The Counter Improvised-Threat (C-IT) Technology Demonstration, Prototype Development, and Testing program element supports the development, demonstration, and testing of improvised threat defeat technologies to advance the JIDO analytical infrastructure, methods, and tools (JS) and enhance counter IED and counter small unmanned aerial system (JC) solutions. Advancements in advanced analytics include the continued production of custom software tools that leverage constantly-evolving machine learning and artificial intelligence algorithms and methods increasing our ability to more quickly develop threat facilitation network connections and activities for the CCMDs. Driven by the current threat still facing deployed US forces, this investment also enables rapid development and delivery of capabilities that more-fully enable the identification, detection, prevention, neutralization, exploitation, and risk mitigation of IEDs, threat-small UASs, and their effects. This also includes test and evaluation facilities and capabilities.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Defense Threat Reduction Agency	Date: March 2019
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Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604134BR I <i>Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing</i>
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B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	255.661	12.743	0.000	12.743
Current President's Budget	144.934	169.638	0.000	113.590	113.590
Total Adjustments	144.934	-86.023	-12.743	113.590	100.847
• Congressional General Reductions	-	-89.523			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	3.500			
• Congressional Directed Transfers	144.934	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Realignment	-	-	-12.743	113.590	100.847

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

Project: JC: *Enable Rapid Capability Delivery*

Congressional Add: *Hyperspectral Improvised Explosive Device (IED) Detection*

	FY 2018	FY 2019
	0.000	3.500
Congressional Add Subtotals for Project: JC	0.000	3.500
Congressional Add Totals for all Projects	0.000	3.500

Change Summary Explanation

The change in FY 2020 is due to the continuation of Overseas Contingency Operations (OCO) at a lower level of funding than in FY 2019. The FY2020 OCO Request is for prioritized threat focused areas: Attack the Network, Home-made Explosives, (HME), Vehicle Borne IEDs (VBIED), and Buried IEDs. These will focus capability delivery to meet current warfighter requirements and the evolving threat where they are deployed. Investments in JS: Assist Situation Understanding are for Counter Threat Networks including early action to defeat their pathways and prevent adversaries from acquiring or enhancing their improvised threat capabilities.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604134BR / Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing				Project (Number/Name) JC / Enable Rapid Capability Delivery			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
JC: Enable Rapid Capability Delivery	0.000	117.640	148.772	0.000	103.793	103.793	59.860	109.236	105.258	106.598	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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

DTRA delivers counter-threat materiel solutions in support of US Joint Forces, effectively addressing changes to threat tactics, techniques, and procedures (TTPs) affecting deployed forces. Capability incorporates an embedded tactical presence to understand a continuously evolving threat environment as well as complete visibility of the current DoD counter-threat portfolio to enable rapid response to warfighter vulnerabilities and to enhance force protection and maneuverability. DTRA responds to the following improvised threats: Anti-Armor IED (AAIED), Booby Trapped Structures (BTS), Buried IED, Home-Made Explosives (HME), Personnel-Borne IED (PBIED), Radio Controlled IED (RCIED), improvised threats within tunnels, Vehicle-Attached IED (VAIED), Vehicle-Borne IED (VBIED), Water-Borne IED (WBIED), C-sUAS and emerging threats that are identified by the forward deployed warfighter and technology outreach team.

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

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: JC: Enable Rapid Capability Delivery	117.640	145.272	0.000	103.793	103.793
Description: This project delivers counter-threat materiel solutions in support of US Joint Forces supporting contingency operations, effectively addressing changes to threat tactics, techniques, and procedures (TTPs) affecting deployed forces.					
FY 2019 Plans:					
- Conduct and participate in test and evaluation events in support of improvised threats.					
- Develop and test C-IED/C-sUAS systems for compatibility prior to systems deploying to operational theaters in support of the warfighter.					
- Maintain production platforms that support the development and fielding of capabilities that combat improvised threats and the threat network.					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604134BR / Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing	Project (Number/Name) JC / Enable Rapid Capability Delivery	

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

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Improve deployable forensic field kits to provide near real time feedback and reduce the reach back support requirement. - Conduct modeling and simulation in support of countering improvised threats - Continue threat device characterization, prototyping and production. FY 2020 Base Plans: N/A FY 2020 OCO Plans: - Increase Positive Detection (PD) and acceptable False Alarm Rate (FAR) with multiple integrated sensors in Latest Time of Value (LTOV) in support of Standoff Detection of improvised threats (PBIED & VBIED). - Improve size, weight, power and integration of sensors to small unmanned systems. - Improve on-board vs. off-board data processing to provide real time data in unmanned systems to support real time improvised threat detection. - Identify and develop portable technology to look through walls and identify hazards with fidelity in real-time for BTS. - Conduct proof of concept for unmanned vehicle that can autonomously operate within confined spaces and provide necessary imagery to operator for BTS. - Integrate sensors to detect various anomalies in unstructured environment with the ability to detect through clothes and report in real-time at safe standoff distances in support of PBIED. - Improve/develop detection and defeating sUAS (RCMA) capabilities against future technology, including acoustic detection at range, machine learning of constantly changing threat signatures (acoustic, RF signal, radar cross-section, optics, Unattended Radiated Emissions (URE), etc.). - Develop anti-armor detection and defeat capabilities, to include real-time reporting from sensors on mounted vehicles that can detect roadside threats in high clutter, while operating at tactical speed, with high Positive Detection and acceptable False Alarm Rate. - Improve mounted detection of buried IEDs through real-time reporting from sensors on mounted vehicles that can detect buried threats at depths while conducting maneuver operations at speed with high Positive Detection and acceptable False Alarm Rate. Hardware improvements enable faster sensing and software improvements enable faster systems-of-systems reporting (higher Positive Detection and lower False Alarm Rate). - Develop Machine Learning for counter improvised threat technologies and solutions to increase effectiveness of developed/developing capabilities. This would enhance the effectiveness of solutions such as sensors' ability to identify signatures, rapid identification, and detection of IED threats.					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604134BR / <i>Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing</i>	Project (Number/Name) JC / <i>Enable Rapid Capability Delivery</i>	

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Increase Artificial Intelligence of sensors to better sort through an enormous quantity of data, illuminating the relevant actionable information and accelerating the decision making process, often autonomously. Machine learning coupled with artificial intelligence dramatically enhances the effectiveness of systems and our warfighting capabilities. - Finalize production of the Hyper Spectral Imaging Sensor form factor so that it can be utilized on C-sUAS platforms. <i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> The decrease from FY 2019 to FY 2020 is due to decreased investment in RDT&E technology enablers and technologies to respond to improvised threats such as booby trapped structures, buried IED, person born IED, and water born IED.					
Accomplishments/Planned Programs Subtotals	117.640	145.272	0.000	103.793	103.793
	FY 2018	FY 2019			
<i>Congressional Add:</i> Hyperspectral Improvised Explosive Device (IED) Detection	0.000	3.500			
<i>FY 2018 Accomplishments:</i> N/A					
<i>FY 2019 Plans:</i> - Began technology development for a small Size, Weight, and Power (SWAP) Hyperspectral Airborne Sensor designed to integrate on a Group 3 Unmanned Air Vehicle (UAV) platform in order to detect Targets of Interest. The Hyperspectral Sensor will be full spectrum which is defined as capable of detecting targets within the Visible and Near-Infrared (VNIR), Short Wave Infra-Red (SWIR), and Long Wave Infra-Red (LWIR) spectrums.					
Congressional Adds Subtotals	0.000	3.500			

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 10/0602134BR/JC: <i>Improvised Threat Reduction Applied Research</i>	0.000	0.000	0.000	0.502	0.502	0.512	0.522	0.533	0.543	Continuing	Continuing
• 27/0603134BR/JC: <i>Counter Improvised-Threat Simulation</i>	23.366	13.648	0.000	49.528	49.528	50.110	50.250	47.887	48.194	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604134BR / <i>Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing</i>	Project (Number/Name) JC / <i>Enable Rapid Capability Delivery</i>	

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

<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u> <u>Base</u>	<u>FY 2020</u> <u>OCO</u>	<u>FY 2020</u> <u>Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
Remarks											

D. Acquisition Strategy

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

E. Performance Metrics

Percentage of completed Counter Improvised-Threat Technology demonstration programs transitioning to warfighter or Services each year.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Defense Threat Reduction Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604134BR / Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing				Project (Number/Name) JC / Enable Rapid Capability Delivery					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Anti-Armor IED (AAIED)	C/FFP	Battelle : Idaho Falls, ID	-	-		7.000	Apr 2019	0.000		7.052	Nov 2019	7.052	Continuing	Continuing	-
Booby Trapped Structures (BTS)	C/FFP	Shield AI : San Diego, CA	-	3.420	May 2018	9.350	May 2019	0.000		4.251	May 2020	4.251	Continuing	Continuing	-
Buried IED	C/CPFF	Naval Research Lab : Washington, DC	-	-		5.500	Feb 2019	0.000		2.299	Nov 2019	2.299	Continuing	Continuing	-
Home-Made Explosives (HME)	C/CPFF	Manufacturing Techniques, Inc. (MTEQ) HQ : Lorton, VA	-	17.956	Mar 2018	4.801	Mar 2019	0.000		5.002	Mar 2020	5.002	Continuing	Continuing	-
Network	C/FFP	John Hopkins : Baltimore, MD	-	16.121	Apr 2018	15.689	Apr 2019	0.000		12.875	Apr 2020	12.875	Continuing	Continuing	-
Person-Born IED (PBIED)	C/FFP	MIT Lincoln Laboratory (MIT-LL) : Lexington, MA	-	4.000	May 2018	8.400	May 2019	0.000		5.752	May 2020	5.752	Continuing	Continuing	-
Radio Controlled IED (RCIED)	C/CPFF	Rampart Technologies, Colorado Springs, CO : Sericore, Hanover, MD	-	-		-		0.000		0.500	Nov 2019	0.500	Continuing	Continuing	-
RDT&E Technology Enablers	C/CPFF	Various : Various	-	18.663	Jan 2018	37.861	Jan 2019	0.000		12.662	Jan 2020	12.662	Continuing	Continuing	-
Sensitive Integration Office Programs	C/CPFF	Various : Various	-	15.551	Jun 2018	15.000	May 2019	0.000		10.000	Nov 2019	10.000	Continuing	Continuing	-
Tunnel	C/FFP	ERDC: Vicksburg, MS : MIT Lincoln Labs: Boston, MA	-	5.250	Mar 2018	7.000	Mar 2019	0.000		0.000	Mar 2020	0.000	Continuing	Continuing	-
Unmanned Aerial Systems (UAS)	C/FFP	Technology Service Corporation (TSC) Fairfax, VA : BAE Systems, Fridley, MN	-	10.223	May 2018	5.950	May 2019	0.000		17.005	May 2020	17.005	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Defense Threat Reduction Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604134BR / Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing				Project (Number/Name) JC / Enable Rapid Capability Delivery					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Vehicle-Attached IED (VAIED)	C/CPFF	Various : TBD	-	-		1.300	Apr 2019	0.000		0.000		0.000	Continuing	Continuing	-
Vehicle-Borne IED (VBIED)	C/CPFF	Naval Surface Warfare Center (NSWC) Dahlgren : King George County, VA	-	7.500	May 2018	10.500	May 2019	0.000		5.249	May 2020	5.249	Continuing	Continuing	-
Water-Borne IED (WBIED)	C/FFP	Various : Various	-	0.954	Aug 2018	2.000	Aug 2019	0.000		0.000	Aug 2020	0.000	Continuing	Continuing	-
Subtotal			-	99.638		130.351		0.000		82.647		82.647	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	MIPR	Naval Air Weapons Station : China Lake, CA	-	11.485	Apr 2018	12.316	Dec 2018	0.000		13.637	Dec 2019	13.637	Continuing	Continuing	-
T&E Threat Support	MIPR	Intelligence and Information Warfare Directorate (I2WD), Communications-Electronics Research, Development and Engineering Center (CERDEC) : Aberdeen Proving Ground, MD	-	5.275	Apr 2018	6.105	Dec 2018	0.000		7.509	Dec 2019	7.509	Continuing	Continuing	-
SETA Capability Research Architecture Cell (CRAC)	C/CPAF	Zel Technologies : Reston, VA	-	1.242	Sep 2018	0.000		0.000		0.000		0.000	0.000	1.242	1.242
Subtotal			-	18.002		18.421		0.000		21.146		21.146	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Defense Threat Reduction Agency										Date: March 2019			
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604134BR / <i>Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing</i>					Project (Number/Name) JC / <i>Enable Rapid Capability Delivery</i>			
	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	117.640		148.772		0.000		103.793		103.793	Continuing	Continuing	N/A
Remarks													

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604134BR / Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing	Project (Number/Name) JC / Enable Rapid Capability Delivery	

	FY 2011				FY 2012				FY 2013				FY 2014				FY 2015				FY 2016				FY 2017			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Anti-Armor IED (AAIED)																												
Explosive Form Projectile (EFP) Detect - High Resolution Electro-Optical Infrared Camera (HREIOR)																												
Explosive Form Projectile (EFP) Detect - Stalker																												
Explosive Form Projectile (EFP) Detect Spiral																												
Non-Linear Junction Tech																												
EFP Detection & Defeat																												
Booby Trapped Structures (BTS)																												
Iron Horse																												
Buried IED																												
Microwave Frequency Oscillator (MFO) - Mineroller																												
Spectral Polarimetric Instrument Data Analysis (SPIDA)																												
SPIDA Spiral (Automated Change Detection)																												
Home-Made Explosives (HME)																												
Mini Hyper Spectral Imaging Group 3																												
SPINS (Standoff Portable Isotopic Neutron Spectroscopy)																												
Improvised Threat Device Replication																												
T&E Threat Support																												
Network																												
Cobalt Doom																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Defense Threat Reduction Agency																	Date: March 2019																				
Appropriation/Budget Activity										R-1 Program Element (Number/Name)								Project (Number/Name)																			
0400 / 4										PE 0604134BR / Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing								JC / Enable Rapid Capability Delivery																			
										FY 2011				FY 2012				FY 2013				FY 2014				FY 2015				FY 2016				FY 2017			
										1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Explosives attribution and exploitation (EA2)																																					
Gold Bloom																																					
Improved National Technical Means (NTM) Integration																																					
Iris Sanctum																																					
North Wind																																					
Tough Luck																																					
Velvet Paper Product Funding																																					
Person-Born IED (PBIED)																																					
Atomic Magnetometer																																					
PBIED Sensor Integration (Tiger Paw)																																					
Radio Controlled IED (RCIED)																																					
Songbird (Whistler Spiral)																																					
RDT&E Technology Enablers																																					
JD-MS8 Travel 4																																					
Rapid Experimentation and Analysis for Development Support (READS)																																					
Sensitive Integration Office SOCOM Support																																					
Technical Outreach BA 4																																					
UK Joint Tech Development																																					
Counter-small Unmanned Aerial Systems (C-sUAS)																																					
C-sUAS Test and Eval																																					
C-sUAS Threat Devices																																					
GroundTaker																																					

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Defense Threat Reduction Agency																Date: March 2019																					
Appropriation/Budget Activity 0400 / 4										R-1 Program Element (Number/Name) PE 0604134BR / Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing								Project (Number/Name) JC / Enable Rapid Capability Delivery																			
										FY 2011				FY 2012				FY 2013				FY 2014				FY 2015				FY 2016				FY 2017			
										1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Microwave Frequency Oscillator (MFO) C-sUAS																																					
Mobile C-sUAS Airborne Platform Suite (MCAPS) Spiral																																					
Multi vs. Multi Airborne Dispersed																																					
Multi vs. Multi Dismounted Deployed																																					
Pike on Reaper																																					
Test & Eval																																					
Test & Evaluation Support																																					
Vehicle-Borne IED (VBIED)																																					
Supernova Spiral																																					
VBIED Detection Sensor Integration																																					
										FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
										1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Anti-Armor IED (AAIED)																																					
Explosive Form Projectile (EFP) Detect - High Resolution Electro-Optical Infrared Camera (HREIOR)																																					
Explosive Form Projectile (EFP) Detect - Stalker																																					
Explosive Form Projectile (EFP) Detect Spiral																																					
Non-Linear Junction Tech																																					
EFP Detection & Defeat																																					
Booby Trapped Structures (BTS)																																					
Iron Horse																																					

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Defense Threat Reduction Agency																		Date: March 2019										
Appropriation/Budget Activity										R-1 Program Element (Number/Name)								Project (Number/Name)										
0400 / 4										PE 0604134BR / Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing								JC / Enable Rapid Capability Delivery										
	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Buried IED																												
Microwave Frequency Oscillator (MFO) - Mineroller																												
Spectral Polarmetric Instrument Data Analysis (SPIDA)																												
SPIDA Spiral (Automated Change Detection)																												
Home-Made Explosives (HME)																												
Mini Hyper Spectral Imaging Group 3																												
SPINS (Standoff Portable Isotopic Neutron Spectroscopy)																												
Improvised Threat Device Replication																												
T&E Threat Support																												
Network																												
Cobalt Doom																												
Explosives attribution and exploitation (EA2)																												
Gold Bloom																												
Improved National Technical Means (NTM) Integration																												
Iris Sanctum																												
North Wind																												
Tough Luck																												
Velvet Paper Product Funding																												
Person-Born IED (PBIED)																												
Atomic Magnetometer																												
PBIED Sensor Integration (Tiger Paw)																												
Radio Controlled IED (RCIED)																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Defense Threat Reduction Agency **Date:** March 2019

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604134BR / Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing	Project (Number/Name) JC / Enable Rapid Capability Delivery
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	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Songbird (Whistler Spiral)																												
RDT&E Technology Enablers																												
JD-MS8 Travel 4																												
Rapid Experimentation and Analysis for Development Support (READS)																												
Sensitive Integration Office SOCOM Support																												
Technical Outreach BA 4																												
UK Joint Tech Development																												
Counter-small Unmanned Aerial Systems (C-sUAS)																												
C-sUAS Test and Eval																												
C-sUAS Threat Devices																												
GroundTaker																												
Microwave Frequency Oscillator (MFO) C- sUAS																												
Mobile C-sUAS Airborne Platform Suite (MCAPS) Spiral																												
Multi vs. Multi Airborne Dispersed																												
Multi vs. Multi Dismounted Deployed																												
Pike on Reaper																												
Test & Eval																												
Test & Evaluation Support																												
Vehicle-Borne IED (VBIED)																												
Supernova Spiral																												
VBIED Detection Sensor Integration																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604134BR / <i>Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing</i>	Project (Number/Name) JC / <i>Enable Rapid Capability Delivery</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Anti-Armor IED (AAIED)</i>				
Explosive Form Projectile (EFP) Detect - High Resolution Electro-Optical Infrared Camera (HREIOR)	1	2020	4	2021
Explosive Form Projectile (EFP) Detect - Stalker	1	2020	4	2021
Explosive Form Projectile (EFP) Detect Spiral	1	2020	4	2020
Non-Linear Junction Tech	1	2019	4	2020
EFP Detection & Defeat	1	2020	1	2020
<i>Booby Trapped Structures (BTS)</i>				
Iron Horse	3	2019	1	2021
<i>Buried IED</i>				
Microwave Frequency Oscillator (MFO) - Mineroller	1	2019	2	2021
Spectral Polarmetric Instrument Data Analysis (SPIDA)	1	2019	4	2020
SPIDA Spiral (Automated Change Detection)	3	2020	4	2022
<i>Home-Made Explosives (HME)</i>				
Mini Hyper Spectral Imaging Group 3	4	2018	4	2020
SPINS (Standoff Portable Isotopic Neutron Spectroscopy)	3	2019	2	2021
<i>Improvised Threat Device Replication</i>				
T&E Threat Support	1	2020	4	2023
<i>Network</i>				
Cobalt Doom	1	2018	4	2020
Explosives attribution and exploitation (EA2)	1	2019	4	2023
Gold Bloom	2	2013	4	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Defense Threat Reduction Agency				Date: March 2019	
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0604134BR / Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing		Project (Number/Name) JC / Enable Rapid Capability Delivery	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
Improved National Technical Means (NTM) Integration		4	2019	4	2021
Iris Sanctum		4	2012	4	2023
North Wind		4	2015	4	2023
Tough Luck		2	2014	4	2023
Velvet Paper Product Funding		3	2011	4	2023
Person-Born IED (PBIED)					
Atomic Magnetometer		2	2019	3	2021
PBIED Sensor Integration (Tiger Paw)		1	2018	2	2021
Radio Controlled IED (RCIED)					
Songbird (Whistler Spiral)		1	2020	4	2023
RDT&E Technology Enablers					
JD-MS8 Travel 4		1	2018	4	2023
Rapid Experimentation and Analysis for Development Support (READS)		3	2012	4	2023
Sensitive Integration Office SOCOM Support		1	2015	4	2019
Technical Outreach BA 4		1	2016	4	2020
UK Joint Tech Development		1	2019	4	2023
Counter-small Unmanned Aerial Systems (C-sUAS)					
C-sUAS Test and Eval		2	2019	4	2023
C-sUAS Threat Devices		2	2019	4	2023
GroundTaker		3	2018	4	2020
Microwave Frequency Oscillator (MFO) C-sUAS		4	2016	4	2020
Mobile C-sUAS Airborne Platform Suite (MCAPS) Spiral		2	2019	4	2020
Multi vs. Multi Airborne Dispersed		1	2020	4	2022
Multi vs. Multi Dismounted Deployed		1	2020	4	2022
Pike on Reaper		4	2019	4	2021

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Defense Threat Reduction Agency **Date:** March 2019

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604134BR / <i>Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing</i>	Project (Number/Name) JC / <i>Enable Rapid Capability Delivery</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Test & Eval</i>				
Test & Evaluation Support	1	2020	4	2023
<i>Vehicle-Borne IED (VBIED)</i>				
Supernova Spiral	4	2019	4	2021
VBIED Detection Sensor Integration	3	2019	4	2020

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604134BR / Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing				Project (Number/Name) JR / Enable DoD Responsiveness			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
JR: Enable DoD Responsiveness	0.000	9.790	7.725	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	17.515
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
This project enhances US Joint Forces’ responsiveness to improvised weapons. DTRA builds counter-threat solutions in full collaboration with its partners. Through a robust communities of action approach, DTRA coordinates with the Combatant Commanders (CCDRs), the Joint Staff, the Military Departments/Services, the interagency, coalition partners, industry, and academia to develop Counter-Improvised Explosive Device (C-IED) and Counter Improvised-Threat (C-IT) solutions that further enable the maneuverability and force protection of deployed US Joint Forces. This methodology leverages the authorities, access, and capabilities of the entire US Government and its partners as counter-improvised threat solutions are developed and realized.												
DTRA responds to the following improvised threats: Home-Made Explosives (HME), Vehicle-Borne IED (VBIED), Counter- small Unmanned Aerial Systems (C-sUAS) Vehicle-Attached IED (VAIED), Anti-Armor IED (AIED) Buried IED, Radio Controlled IED (RCIED), Personnel-Borne IED (PBIED), Booby Trapped Structures (BTS), Improvised WMD, Water-Borne IED (WBIED), improvised threats within tunnels, and emerging threats that are identified by the warfighter deployed forward.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: JR: Enable DoD Responsiveness								9.790	7.725	-	-	-
FY 2019 Plans: N/A												
FY 2019 to FY 2020 Increase/Decrease Statement: The decrease from FY 2019 to FY 2020 is due to the realignment of activities in Project JR-Enable DoD Responsiveness to Project JC-Enable Rapid Capability Delivery to better support advanced technology development to meet emerging improvised threats.												
Accomplishments/Planned Programs Subtotals								9.790	7.725	-	-	-
C. Other Program Funding Summary (\$ in Millions)												
N/A												
Remarks												

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604134BR / <i>Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing</i>	Project (Number/Name) JR / <i>Enable DoD Responsiveness</i>
<u>D. Acquisition Strategy</u> Assessment and selection of best performer for developmental requirements to meet specific military capability needs. Performer base includes research developers across DoD and other Government agency laboratories, academia, and industry. <u>E. Performance Metrics</u> Percentage of completed Counter Improvised-Threat Technology demonstration programs transitioning to Warfighter each year.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Defense Threat Reduction Agency													Date: March 2019		
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0604134BR / <i>Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing</i>					Project (Number/Name) JR / <i>Enable DoD Responsiveness</i>						

Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
RDT&E Technology Enablers	C/CPFF	Various : Various	-	9.657	Jan 2018	7.570	Jan 2019	-		-		-	0.000	17.227	17.227
Subtotal			-	9.657		7.570		-		-		-	0.000	17.227	N/A

Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	MIPR	Naval Air Weapons Station : China Lake, CA	-	0.133	Jun 2018	0.155	Jan 2019	-		-		-	Continuing	Continuing	-
Subtotal			-	0.133		0.155		-		-		-	Continuing	Continuing	N/A

			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	9.790		7.725		-		-		-	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604134BR / Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing	Project (Number/Name) JR / Enable DoD Responsiveness	

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
N/A																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604134BR / <i>Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing</i>	Project (Number/Name) JR / <i>Enable DoD Responsiveness</i>	

Schedule Details

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

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604134BR / Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing				Project (Number/Name) JS / Assist Situational Understanding			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
JS: Assist Situational Understanding	0.000	17.504	13.141	0.000	9.797	9.797	10.090	10.286	10.585	10.887	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project enables DTRA to design, develop, test, and deliver IT capabilities that support the ability to understand and analyze global threat information. The project allows DTRA to rapidly develop, test and engineer analytical products, threat models and simulations, data science methodologies, software applications, and to integrate intelligence data sources that enable the rapid collection, fusion, and dissemination of operational-intelligence and technology in order to enable the defeat of threat networks that employ disruptive technologies.

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

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

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

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: JS: Assist Situational Understanding	17.504	13.141	0.000	9.797	9.797
Description: This project enables DTRA to design, develop, test, and deliver IT capabilities that support the ability to understand and analyze global threat information. The project allows DTRA to rapidly develop analytical products, threat models and simulations, data science methodologies, software applications, and to integrate					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604134BR / <i>Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing</i>	Project (Number/Name) JS / <i>Assist Situational Understanding</i>	

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

intelligence data sources that enable the rapid collection, fusion, and dissemination of operational-intelligence and technology in order to enable the defeat of threat networks that employ disruptive technologies.

FY 2019 Plans:

- Effort to consolidate Web Visualizations for DTRA Improvised Explosive Device/small Unmanned Aerial Systems (IED/sUAS) data. This will include the Common Intelligence Picture/Common Operational Picture and technical data and will serve as the platform for creation of Counter-IED/Counter-sUAS (C-IED/C-sUAS) analytics.
- Build a data science enabled module that will crawl through Catapult reporting and identify reports related to IED/sUAS events. Through machine learning techniques and application of training data, the team will train this module to identify reports that normal queries may miss. These reports will serve as the base data set for the CIED/C-sUAS event table.
- Prepare a list of vetted IED/sUAS events pulled from Catapult reporting. Events will be broken down into relevant categories with associated attributes.
- Stand up a database of technical data associated with known IED/sUAS. Library will be available for direct query and incorporated into other C-IED/C-sUAS capabilities.
- Integrate Virtual Management System processes and capabilities to build 3D models for various maritime vessels requested by external Special Operations Forces (SOF) customer.
- Develop and test a software mapping tool and spatial data analytics technology web service capable of a providing user functionality to create basic geospatial analytic outputs (i.e., line of sight, route vulnerability, etc.).
- Generate additional Data Science tables populated with entities extracted from Catapult using Riplt regex trees. This will provide a "truth set" for future Natural Language Processing.
- Develop and Test new tools allowing for the visualizing (and effects) of underwater explosions.
- Develop a new application (Thor) as a "rules-based" approach to existing Avengers/Phoenix models. Thor is planned to enhance sensitive site exploitation (SSE) data with a tool will provide comprehensive approach to SSE vetting.
- Develop capability to visualize and derive trends for Air and Marine Operations Center non-commercial flight data.
- Develop and test an Interactive interface which will provide access to the Avenger tool suite on selective networks.
- Scope and Design the Data Science software and tool development environment as to create containerized

FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency				Date: March 2019		
Appropriation/Budget Activity 0400 / 4		R-1 Program Element (Number/Name) PE 0604134BR / Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing		Project (Number/Name) JS / Assist Situational Understanding		
B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
tools which will provide a standard working image across the multiple networks. - Provide a methodology leveraging contextual clues from reporting, to provide additional information about individual person entities extracted from reports. (e.g., job title). - Develop and Test custom webpages that will provide “pre-vetted” data against analyst problem set. Automated workflow built for specific customer needs. - Develop and test a web-based Horizon version to act as a location intelligence discovery tool. The tool will provide geospatial querying within 2D maps to users as a light weight alternative to the smart-client version. - Develop and test a web-based Cognitive Counter-Improvised Explosive Device Signature System (C2IS2) tool that will provide OP/INTEL users with the capability to capture and manage the processes, observables, and signatures associated with IED operations and use that data for training, analysis, collection planning, and exploitation. - Continued improvements to the DevOps Pipeline and maturing the approach to delivery using containers - Deploy a subset of the Attack the Network Tool Suite (ANTS) application on Non-Classified Local Area Network and an easy navigation directory. - Provide Integration and Test activities against a Battlefield Information Collection and Exploitation System (BICES) instance of Catapult. Upgrade and test all applications to work with Metrics across the ANTS Suite, upgrade the user account and authentication in relation to the F5/Certificate Authentication System, and deploy Horizon Web. - Conduct System Integration of Catapult and all ANTS applications on the new HP Moonshot hardware. - Support proper deployment procedures and provide a test environment for the newly deployed Catapult and ANTS related applications on HP Moonshot hardware. - Test all Catapult and all ANTS applications at a COOP location. FY 2020 Base Plans: N/A FY 2020 OCO Plans: - Extend current DTRA Mission IT capability (Vantage), which supports Force Protection and Mission Planning, with augmented reality and virtual reality technologies (Examples include: HoloLens and Oculus Rift) - Creation of new 3D visualizations for underwater/Bathymetric datasets to support maritime operations and mitigate new improvised threats						

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604134BR / <i>Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing</i>	Project (Number/Name) JS / <i>Assist Situational Understanding</i>	

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Integration of C-sUAS geo-spatial enabled data from the cloud architecture (Catapult) with VMS developed applications such as Foxhole to better visualize the effectiveness of proposed C-sUAS systems and optimize C-sUAS system placement in tactical/operational environments - Integration of machine learning for automated geo-spatial feature extraction creating time efficiencies in support of Request for Support (RFS) product delivery to include line of sight analysis, threat vulnerability assessments, and blast modeling. - Develop inter-operability with geo-spatial applications/models across the 70+ production facing developed tool suite. Examples include integrating advanced geo-spatial models with multi-INT data through Team Phoenix developed capabilities to include Voltron and JIDO J6 developed Horizon tool. - Integration of new Data Science environment, which will spawn graph analytics, machine learning, and neural networks against the 126M unique documents resident within Catapult - Cross corpus entity resolution and correlation to identify similar entities across multiple reports and reporting types resident within the Catapult architecture/data lake. This will include techniques to track specific Catapult entities across time and their locations mentioned in relevant reporting. These new techniques will expand DTRA's ability to identify and track improvised threat networks through automation. - Create a set of data preparation micro-services to build an efficient pipeline for incorporation of Catapult data into future Data Science algorithms and experiments. - Enhancing location precision and categorization of Catapult-extracted locations to provide more accurate geospatial plotting of relevant locations. Improvements to Natural Language Processing extraction of location information through supplementing extracted locations with relevant attributes derived from the context of the report. <i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> The decrease from FY 2019 to FY 2020 is due to the maturation and transition of the Catapult Program of Record (PoR) from an advanced technology development effort to a sustained core capability. Continued RDT&E funding supports engineering and testing of new capabilities developed for DTRA's Quick Reaction Capability (QRC) mission that transition to the PoR for sustainment because they have broader, enduring utility for the DoD community.					
Accomplishments/Planned Programs Subtotals	17.504	13.141	0.000	9.797	9.797

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency **Date:** March 2019

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604134BR / <i>Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing</i>	Project (Number/Name) JS / <i>Assist Situational Understanding</i>
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u> <u>Base</u>	<u>FY 2020</u> <u>OCO</u>	<u>FY 2020</u> <u>Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 10/0602134BR/JS: <i>Improvised Threat Reduction Applied Research</i>	0.000	0.000	0.000	1.175	1.175	1.711	1.745	1.780	1.815	Continuing	Continuing

Remarks

D. Acquisition Strategy

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

E. Performance Metrics

- Performing contractors operate under a Cost Plus/Award Fee contract measured by a number of mutually agreed Service Level Agreements (SLAs). Measurement Awards is done semi-annually. The contractor is required to provide Monthly status and progress against the SLAs.
- System metrics are measured by usage to include network, number of users, data, scope, integrations, and access.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Defense Threat Reduction Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604134BR / Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing					Project (Number/Name) JS / Assist Situational Understanding				
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Attack the Network Suite (MIT) - Systems Integration Lab (SIL) - Direct Operations Support	C/CPAF	Booz Allen Hamilton : Reston, VA	-	1.199	Aug 2018	1.236	Aug 2019	0.000		0.891	Aug 2020	0.891	Continuing	Continuing	-
Attack the Network Suite (MIT) - Systems Integration Lab (SIL) - Mission IT Capability Development (Automation and Data Science)	C/CPAF	Booz Allen Hamilton : Reston, VA	-	1.799	Aug 2018	1.854	Aug 2019	0.000		1.230	Aug 2020	1.230	Continuing	Continuing	-
Sandia	MIPR	Sandia National Laboratories : Reston, VA	-	0.032	Oct 2017	0.040	Oct 2018	0.000		0.040	Oct 2019	0.040	Continuing	Continuing	-
IRTM	MIPR	Office of Naval Research : Arlington, VA	-	0.257	Aug 2018	0.000		0.000		0.000		0.000	0.000	0.257	0.257
Network	C/FFP	John Hopkins : Baltimore, MD	-	1.815	Jun 2018	0.362	Jan 2019	0.000		0.000		0.000	0.000	2.177	2.177
Vehicle-Borne IED (VBIED)	C/CPFF	Naval Surface Warfare Command : Dahlgren, VA	-	8.500	Jun 2018	1.449	Jan 2019	0.000		0.000		0.000	0.000	9.949	9.949
Subtotal			-	13.602		4.941		0.000		2.161		2.161	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Attack the Network Suite (MIT) - Systems Integration Lab (SIL) - Direct Operations Support	C/CPAF	Booz Allen Hamilton : Reston, VA	-	0.400	Aug 2018	0.412	Aug 2019	0.000		0.297	Aug 2020	0.297	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Defense Threat Reduction Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604134BR / Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing				Project (Number/Name) JS / Assist Situational Understanding					
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Attack the Network Suite (MIT) - Systems Integration Lab (SIL) - Mission IT Capability Development (Automation and Data Science)	C/CPAF	Booz Allen Hamilton : Reston, VA	-	0.599	Aug 2018	0.618	Aug 2019	0.000		0.410	Aug 2020	0.410	Continuing	Continuing	-
QRC IT Network (OIR)	C/CPAF	Booz Allen Hamilton : Reston, VA	-	-		1.366	Mar 2019	0.000		1.476	Mar 2020	1.476	Continuing	Continuing	-
QRC IT Network (RS)	C/CPAF	Booz Allen Hamilton : Reston, VA	-	-		0.258	Mar 2019	0.000		0.260		0.260	Continuing	Continuing	-
Sandia	MIPR	Sandia National Laboratories : Reston, VA	-	0.097	Oct 2017	0.168	Oct 2018	0.000		0.120	Oct 2019	0.120	Continuing	Continuing	-
Catapult / CTN Tool Suite Program of Record Support	C/CPAF	Zel Technologies : Reston, VA	-	0.319	Sep 2018	0.550	Sep 2019	0.000		0.500	Sep 2020	0.500	Continuing	Continuing	-
Carnegie Mellon University-Software Engineering Institute (CMU-SEI)	MIPR	Carnegie Mellon University/SEI : Hanscomb AFB, MA	-	0.215	Mar 2018	0.000	Mar 2019	0.000		0.000	Mar 2020	0.000	0.000	0.215	0.215
Subtotal			-	1.630		3.372		0.000		3.063		3.063	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Attack the Network Suite (MIT) - Systems Integration Lab (SIL) - Direct Operations Support	C/CPAF	Booz Allen Hamilton : Reston, VA	-	0.400	Aug 2018	0.412	Aug 2019	0.000		0.297	Aug 2020	0.297	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Defense Threat Reduction Agency **Date:** March 2019

Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604134BR / <i>Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing</i>	Project (Number/Name) JS / <i>Assist Situational Understanding</i>
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Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Attack the Network Suite (MIT) - Systems Integration Lab (SIL) - Mission IT Capability Development (Automation and Data Science)	C/CPAF	Booz Allen Hamilton : Reston, VA	-	0.599	Aug 2018	0.618	Aug 2019	0.000		0.410	Aug 2020	0.410	Continuing	Continuing	-
QRC IT Network (OIR)	C/CPAF	Booz Allen Hamilton : Reston, VA	-	-		1.078	Mar 2019	0.000		1.405	Mar 2020	1.405	Continuing	Continuing	-
QRC IT Network (RS)	C/CPAF	Booz Allen Hamilton : Reston, VA	-	-		1.030	Mar 2019	0.000		1.040	Mar 2020	1.040	Continuing	Continuing	-
Sandia	MIPR	Sandia National Laboratories : Reston, VA	-	0.194	Oct 2017	0.240	Oct 2018	0.000		0.240	Oct 2019	0.240	Continuing	Continuing	-
SETA Capability Research Architecture Cell (CRAC)	C/CPAF	Zel Technologies : Reston, VA	-	1.079	Sep 2018	1.450	Sep 2019	0.000		1.181	Sep 2020	1.181	Continuing	Continuing	-
Subtotal			-	2.272		4.828		0.000		4.573		4.573	Continuing	Continuing	N/A
Project Cost Totals			-	17.504		13.141		0.000		9.797		9.797	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604134BR / <i>Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing</i>	Project (Number/Name) JS / <i>Assist Situational Understanding</i>	

	FY 2011				FY 2012				FY 2013				FY 2014				FY 2015				FY 2016				FY 2017			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Assist Situational Understanding																												
Attack the Network Suite (MIT) - Systems Integration Lab (SIL) - Direct Operations Support																												
Attack the Network Suite (MIT) - Systems Integration Lab (SIL) - Mission IT Capability Development (Automation and Data Science)																												
QRC IT Network (OIR)																												
QRC IT Network (RS)																												
Sandia																												
SETA Capability Research Architecture Cell (CRAC)																												
Catapult / CTN Tool Suite Program of Record Support																												

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Assist Situational Understanding																												
Attack the Network Suite (MIT) - Systems Integration Lab (SIL) - Direct Operations Support																												
Attack the Network Suite (MIT) - Systems Integration Lab (SIL) - Mission IT Capability Development (Automation and Data Science)																												
QRC IT Network (OIR)																												
QRC IT Network (RS)																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Defense Threat Reduction Agency	Date: March 2019
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Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604134BR / <i>Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing</i>	Project (Number/Name) JS / <i>Assist Situational Understanding</i>
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	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Sandia																												
SETA Capability Research Architecture Cell (CRAC)																												
Catapult / CTN Tool Suite Program of Record Support																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604134BR / <i>Counter Improvised-Threat Technology Demonstration, Prototype Development, and Testing</i>	Project (Number/Name) JS / <i>Assist Situational Understanding</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Assist Situational Understanding</i>				
Attack the Network Suite (MIT) - Systems Integration Lab (SIL) - Direct Operations Support	4	2016	4	2021
Attack the Network Suite (MIT) - Systems Integration Lab (SIL) - Mission IT Capability Development (Automation and Data Science)	4	2016	4	2021
QRC IT Network (OIR)	2	2017	2	2022
QRC IT Network (RS)	2	2017	2	2022
Sandia	1	2020	1	2020
SETA Capability Research Architecture Cell (CRAC)	4	2016	4	2021
Catapult / CTN Tool Suite Program of Record Support	4	2016	4	2021

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Defense Threat Reduction Agency **Date:** March 2019

Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0604775BR / Advanced Component Development and Prototypes							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	14.021	-	14.021	12.564	6.800	6.800	6.700	Continuing	Continuing
RA: CWMD Cross-Cutting Technical and Information Sciences	-	0.000	0.000	14.021	-	14.021	12.564	6.800	6.800	6.700	Continuing	Continuing

Note

This program element is a new start.

A. Mission Description and Budget Item Justification

The CWMD Cross-Cutting Technical and Information Sciences project develops mature technologies tied to existing programs in the Defense Threat Reduction Agency's Budget Activity (BA) 3, Advanced Technology Development (ATD) portfolio. This investment helps bridge the developmental gap between science and technology and the advanced developers, effectively increasing the likelihood of transitioning capabilities to the warfighter. This project focuses on development and demonstration of high fidelity models and prototypes for testing in an operational environment, evaluation of integrated systems, technology transition, and rapid insertion of CWMD capabilities to meet critical national security and defense priorities. It specifically supports efforts to successfully transition capabilities from BA3 portfolio to advanced developers or into the hands of end-users for operational experimentation.

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	14.021	-	14.021
Total Adjustments	0.000	0.000	14.021	-	14.021
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Realignment	-	-	14.021	-	14.021

Change Summary Explanation

The change from the 2019 President's Budget is due to realignment of funds to develop prototypes and conduct testing in appropriate operational environments. The desired end-state is to increase the speed at which capabilities will ultimately be put to operational use.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604775BR / <i>Advanced Component Development and Prototypes</i>				Project (Number/Name) RA / <i>CWMD Cross-Cutting Technical and Information Sciences</i>			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RA: <i>CWMD Cross-Cutting Technical and Information Sciences</i>	-	0.000	0.000	14.021	-	14.021	12.564	6.800	6.800	6.700	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The CWMD Cross-Cutting Technical and Information Sciences project develops mature technologies tied to existing programs in the Defense Threat Reduction Agency's Budget Activity (BA) 3, Advanced Technology Development (ATD) portfolio. This project focuses on development and demonstration of high fidelity models and prototypes in appropriate operational environments, evaluation of integrated systems, technology transition, and rapid insertion of CWMD capabilities to meet critical national security and defense priorities. It specifically supports efforts to successfully transition capabilities from the BA3 portfolio to advanced developers or into the hands of end-users for operational experimentation.

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

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: RA: CWMD Cross-Cutting Technical and Information Sciences	0.000	0.000	14.021	0.000	14.021
Description: Project RA develops mature technologies tied to existing programs in the Defense Threat Reduction Agency's BA Advanced Technology Development portfolio for transition to advanced developers and rapid insertion into user communities for realistic operational feedback on efficacy.					
FY 2019 Plans: N/A					
FY 2020 Base Plans: - Mature and demonstrate advanced detection and response capabilities across the threat spectrum to respond to end user requirements. - Initiate mature development and prototyping of predictive models for insertion into partner modeling and simulation platforms. - Demonstrate required maturity and complete required data collection to successfully transition CMWD technologies to advanced development partners in response to specific Combatant Command and Service requirements.					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency								Date: March 2019			
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 0604775BR / <i>Advanced Component Development and Prototypes</i>				Project (Number/Name) RA / <i>CWMD Cross-Cutting Technical and Information Sciences</i>			

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Continue to demonstrate and transition targeting, analytic tools using machine learning, natural language processing, and statistical analytics supporting quick reaction and response capabilities across the CWMD enterprise. <i>FY 2020 OCO Plans:</i> N/A <i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> The increase from FY 2019 to FY 2020 enables DTRA to further mature and demonstrate capabilities through development of prototypes and testing in appropriate operational environments. This investment helps bridge the developmental gap between science and technology and the advanced developers, effectively increasing the likelihood of transitioning capabilities to the warfighter. The desired end-state is to increase the speed at which capabilities will ultimately be put to operational use. This Project had no investment prior to FY 2020.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	14.021	0.000	14.021

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020 Base</u>	<u>FY 2020 OCO</u>	<u>FY 2020 Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• 20/0602718BR/RA: Counter Weapons of Mass Destruction Applied Research	40.189	30.603	46.317	0.000	46.317	48.032	49.312	49.896	58.703	Continuing	Continuing
• 28/0603160BR/RA: Counter Weapons of Mass Destruction Advanced Technology Development	17.732	11.286	34.825	0.000	34.825	30.722	32.739	35.660	37.254	Continuing	Continuing
Remarks											
D. Acquisition Strategy Assessment and down-selection of mature technologies to meet specific CWMD capability requirements.											
E. Performance Metrics Percentage of completed demonstrations transitioning each year both into and from Budget Activity (BA) 4, Advanced Component Development and Prototypes (ACD&P) portfolio in support of Strategic Objective 4.1, "Preserve investments to maintain our decisive technological superiority."											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Defense Threat Reduction Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 0604775BR / Advanced Component Development and Prototypes						Project (Number/Name) RA / CWMD Cross-Cutting Technical and Information Sciences			
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Advanced Predictive Model Maturation	FFRDC	TBD : TBD	-	-		-		3.200	Jan 2020	-		3.200	Continuing	Continuing	-
Threat Detection Technology Maturation	FFRDC	TBD : TBD	-	-		-		3.021	Jan 2020	-		3.021	Continuing	Continuing	-
Maturation of Targeting and Target Assessment Capabilities	C/CPFF	TBD : TBD	-	-		-		2.800	Jan 2020	-		2.800	Continuing	Continuing	-
Counter-Terrorism Response Capability Development	FFRDC	TBD : TBD	-	-		-		2.800	Jan 2020	-		2.800	Continuing	Continuing	-
Analytic Toolkit Maturation and Transition	C/CPFF	TBD : TBD	-	-		-		2.200	Jan 2020	-		2.200	Continuing	Continuing	-
Subtotal			-	-		-		14.021		-		14.021	Continuing	Continuing	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-		0.000		14.021		-		14.021	Continuing	Continuing	N/A
Remarks															
In the first budget year for Budget Activity (BA) 4, Advanced Component Development and Prototypes (ACD&P) funding, the application of funds to technologies within the existing Defense Threat Reduction Agency (DTRA) portfolio will prioritize those technologies that meet the following criteria: 1) Meet a validated, current requirement from a Combatant Command or Service. 2) Are approaching an appropriate level of maturity to transition to either an end-user for operational use and feedback or an advanced development partner. 3) Require a finite amount of additional developmental work required to meet transition needs. 4) Will provide operational capabilities to the warfighter community that enable efforts to counter threat networks. Appropriate technologies will receive investment to meet these transition requirements and provide improved or new capabilities to the warfighter.															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604775BR / <i>Advanced Component Development and Prototypes</i>	Project (Number/Name) RA / <i>CWMD Cross-Cutting Technical and Information Sciences</i>	

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<i>Cross-Cutting Research and Development: Technology Transition</i>																												
Cross-Cutting Research and Development: Technology Transition																												
Advanced Predictive Model Maturation																												
Threat Detection Technology Maturation																												
Maturation of Targeting and Target Assessment Capabilities																												
Counter-Terrorism Response Capability Development																												
Analytic Toolkit Maturation and Transition																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604775BR / <i>Advanced Component Development and Prototypes</i>	Project (Number/Name) RA / <i>CWMD Cross-Cutting Technical and Information Sciences</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Cross-Cutting Research and Development: Technology Transition</i>				
Cross-Cutting Research and Development: Technology Transition	2	2020	4	2024
Advanced Predictive Model Maturation	2	2020	2	2021
Threat Detection Technology Maturation	2	2020	3	2021
Maturation of Targeting and Target Assessment Capabilities	2	2020	1	2021
Counter-Terrorism Response Capability Development	2	2020	4	2021
Analytic Toolkit Maturation and Transition	2	2020	4	2020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Defense Threat Reduction Agency	Date: March 2019
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Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
0400: Research, Development, Test & Evaluation, Defense-Wide / BA 5: System Development & Demonstration (SDD)					PE 0605000BR / *Counter Weapons of Mass Destruction Systems Development							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	25.169	6.199	6.163	13.100	-	13.100	13.150	13.303	13.459	13.618	Continuing	Continuing
RD: Nuclear Technologies and Capabilities Development	-	0.000	0.000	7.500	-	7.500	7.650	7.803	7.959	8.118	Continuing	Continuing
RF: Forensics Technologies	25.169	6.199	6.163	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	37.531
MA: Mission Assurance Risk Management System	-	0.000	0.000	5.600	-	5.600	5.500	5.500	5.500	5.500	Continuing	Continuing

Note

In program element 0605000BR, DTRA consolidated project RF-Forensics Technologies into the renamed project RD-Nuclear Technologies and Capabilities Development beginning in FY 2020.

A. Mission Description and Budget Item Justification

The Counter Weapons of Mass Destruction (WMD) Systems Development program element supports the development and demonstration of verification and monitoring technologies and systems for the Countering Weapons of Mass Destruction (CWMD) mission. This funding specifically supports International Monitoring System technology requirements under the Nuclear Arms Control Technology (NACT) program.

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	6.241	6.163	4.821	-	4.821
Current President's Budget	6.199	6.163	13.100	-	13.100
Total Adjustments	-0.042	0.000	8.279	-	8.279
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Realignments	-0.042	-	2.679	-	2.679
• Functional Transfer	-	-	5.600	-	5.600

Change Summary Explanation

The increase from FY 2019 to FY 2020 is due to increased further investment in Nuclear Arms Control Technology (NACT) to begin the investigating the use of International Monitoring System (IMS) resources for DoD nuclear event response missions.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0605000BR / *Counter Weapons of Mass Destruction Systems Development				Project (Number/Name) RD / Nuclear Technologies and Capabilities Development			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RD: Nuclear Technologies and Capabilities Development	-	0.000	0.000	7.500	-	7.500	7.650	7.803	7.959	8.118	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

DTRA consolidated project RF-Forensics Technologies into the renamed project RD-Nuclear Technologies and Capabilities Development beginning in FY 2020. There is 53.6% real growth in this project.

A. Mission Description and Budget Item Justification

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

The project addresses WMD monitoring, implementation of, and compliance with arms control agreement requirements validated by the Office of the Under Secretary of Defense, Acquisition and Sustainment. This project conforms to the administration's research and development priorities related to countering WMD. Technical assessments are made against nuclear treaty implementation and nuclear event response requirements to provide the basis for sound project development, evaluate existing programs, provide U.S. International Monitoring System (IMS) data, and to access international IMS data required to support U.S. monitoring policy, decision-makers, and negotiation teams.

The primary RDT&E program emphasis is to improve the efficiency, performance, reliability, and sustainability of U.S. IMS stations; optimize IMS capabilities to support both nuclear treaty monitoring and nuclear-event response; and improve capabilities to detect, characterize, and enable discrimination of nuclear events. The NACT program directly supports U.S. and allied warfighter and national technical monitoring requirements and provides vital data used by the treaty monitoring community, warfighter planners, DoD, other U.S. Government agencies, and international agencies.

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

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: RD - Nuclear Technologies and Capabilities Development	0.000	-	7.500	-	7.500

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605000BR / *Counter Weapons of Mass Destruction Systems Development	Project (Number/Name) RD / Nuclear Technologies and Capabilities Development	

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Description: Project RD supports the NACT Program, conducting RDT&E to meet IMS technology requirements in support of CTBT implementation, compliance, monitoring, inspection, and other emerging nuclear arms control activities. FY 2020 Base Plans: - Continue to provide data from IMS infrastructure in support of DoD and Interagency nuclear-event response missions to enhance nuclear event response and consequence management mission capabilities. - Integrate IMS into appropriate DoD and interagency exercises to ensure stakeholder involvement in system optimization and to leverage, to the fullest extent possible, all IMS data streams in informing partner exercise activities. - Analyze technical requirements for new and upgraded capabilities within the IMS infrastructure that will support nuclear event response. - Leverage conventional high explosive test events to evaluate U.S. IMS performance. - Participate in CTBT Organization international- and interagency-sponsored technology development exchanges to ensure IMS research and engineering activities remain current and relevant. FY 2019 to FY 2020 Increase/Decrease Statement: The increase from FY 2019 to FY 2020 is due to the realignment of Project RF-Forensics Technologies into Project RD-Nuclear Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles. Additionally, there was increased investment for NACT to apply IMS capabilities to support DoD and Interagency nuclear-event response missions. Real growth in this project is 19.7%.					
Accomplishments/Planned Programs Subtotals	0.000	-	7.500	-	7.500

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 20/0602718BR/RD: Counter Weapons of Mass Destruction Applied Research	13.745	16.860	92.710	-	92.710	93.612	95.541	97.485	99.433	Continuing	Continuing
• 28/0603160BR/RD: Counter Weapons of Mass Destruction Advanced Technology Development	21.293	26.021	70.153	-	70.153	64.234	60.840	62.070	61.168	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency							Date: March 2019		
Appropriation/Budget Activity 0400 / 5			R-1 Program Element (Number/Name) PE 0605000BR / <i>*Counter Weapons of Mass Destruction Systems Development</i>				Project (Number/Name) RD / <i>Nuclear Technologies and Capabilities Development</i>		

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

<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u> <u>Base</u>	<u>FY 2020</u> <u>OCO</u>	<u>FY 2020</u> <u>Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
Remarks											

D. Acquisition Strategy

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

E. Performance Metrics

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

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Defense Threat Reduction Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0605000BR / *Counter Weapons of Mass Destruction Systems Development				Project (Number/Name) RD / Nuclear Technologies and Capabilities Development					
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Radionuclide sensor, station, laboratory and network improvements	FFRDC	Pacific Northwest National Laboratory : Richland, WA	-	-		-		1.550	Jan 2020	-		1.550	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements; validation and verification testing	FFRDC	Sandia National Laboratory : Albuquerque, NM	-	-		-		1.850	Jan 2020	-		1.850	Continuing	Continuing	-
Radionuclide sensor, station, and network Improvements	MIPR	Air Force Technical Application Center : Patrick AFB, FL	-	-		-		0.500	Dec 2019	-		0.500	Continuing	Continuing	-
Radionuclide sensor, station, laboratory and network improvements	C/CPFF	General Dynamics Mission Systems, Inc : Fairfax, VA	-	-		-		0.435	Nov 2019	-		0.435	Continuing	Continuing	-
Station, and network Improvements	C/CPFF	Leidos Innovations Corp : Alexandria, VA	-	-		-		0.200	Apr 2020	-		0.200	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements	C/CPFF	Pennsylvania State University : State College, PA	-	-		-		0.400	Feb 2020	-		0.400	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements	C/CPFF	University of Alaska Fairbanks : Fairbanks, AK	-	-		-		0.143	Mar 2020	-		0.143	Continuing	Continuing	-
IMEA Software Development	C/CPFF	Applied Research Associates, Inc : Alexandria, VA	-	-		-		0.200	Jan 2020	-		0.200	Continuing	Continuing	-
IMS Gas Background Analysis	FFRDC	Argonne National Laboratory : Argonne, IL	-	-		-		0.200	Dec 2019	-		0.200	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements; validation and verification testing	C/TBD	TBD : TBD	-	-		-		0.160	Mar 2020	-		0.160	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Defense Threat Reduction Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0605000BR / *Counter Weapons of Mass Destruction Systems Development				Project (Number/Name) RD / Nuclear Technologies and Capabilities Development					
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Seismic and Infrasound sensor, station, and network Improvements	MIPR	US Army Corps of Engr : Vicksburg, MS	-	-		-		0.100	Dec 2019	-		0.100	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements	MIPR	Missile Defense Agency : Fort Belvoir, VA	-	-		-		0.650	Mar 2020	-		0.650	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements	C/TBD	University of Alaska : Fairbanks, AK	-	-		-		0.500	Feb 2020	-		0.500	Continuing	Continuing	-
Radionuclide sensor, station, and network Improvements	FFRDC	Savanah River National Laboratory : Savannah River Site Aiken, SC	-	-		-		0.500	Apr 2020	-		0.500	Continuing	Continuing	-
Subtotal			-	-		-		7.388		-		7.388	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Reqn	Various : Ft. Belvoir, VA	-	-		-		0.112	Nov 2019	-		0.112	Continuing	Continuing	-
Subtotal			-	-		-		0.112		-		0.112	Continuing	Continuing	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-		0.000		7.500		-		7.500	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605000BR / *Counter Weapons of Mass Destruction Systems Development	Project (Number/Name) RD / Nuclear Technologies and Capabilities Development	

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<i>Nuclear Arms Control Technologies (NACT)</i>																												
Optimize and improve IMS seismic, infrasound, and radionuclide sensors: infrasound calibration standards, procedures, instrumentation																												
Optimize and improve IMS seismic, infrasound, and radionuclide sensors: radionuclide system improvements to address detection limits and cost effectiveness																												
Optimize and improve IMS station performance: validation and verification testing of RDTE concepts to enable operational implementation																												
Optimize and improve IMS seismic, infrasound, and radionuclide sensors: testing and evaluation of next generation systems																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605000BR / *Counter Weapons of Mass Destruction Systems Development	Project (Number/Name) RD / Nuclear Technologies and Capabilities Development	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Nuclear Arms Control Technologies (NACT)</i>				
Optimize and improve IMS seismic, infrasound, and radionuclide sensors: infrasound calibration standards, procedures, instrumentation	1	2020	4	2021
Optimize and improve IMS seismic, infrasound, and radionuclide sensors: radionuclide system improvements to address detection limits and cost effectiveness	1	2020	4	2021
Optimize and improve IMS station performance: validation and verification testing of RDTE concepts to enable operational implementation	1	2020	4	2024
Optimize and improve IMS seismic, infrasound, and radionuclide sensors: testing and evaluation of next generation systems	1	2020	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0605000BR / *Counter Weapons of Mass Destruction Systems Development				Project (Number/Name) RF / Forensics Technologies			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RF: Forensics Technologies	25.169	6.199	6.163	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	37.531
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

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

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

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

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

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: RF - Forensics Technologies	6.199	6.163	-	-	-
Description: Project RF supports the NACT Program, conducting RDT&E to meet IMS technology requirements in support of CTBT implementation, compliance, monitoring, inspection, and other emerging nuclear arms control activities.					
FY 2019 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency									Date: March 2019		
Appropriation/Budget Activity 0400 / 5				R-1 Program Element (Number/Name) PE 0605000BR / *Counter Weapons of Mass Destruction Systems Development				Project (Number/Name) RF / Forensics Technologies			
B. Accomplishments/Planned Programs (\$ in Millions)							FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Implement use of IMS infrastructure to provide data in support DoD and interagency nuclear-event response missions in order to enhance National Technical Nuclear Forensics (NTNF) and consequence management mission capabilities. - Integrate IMS into appropriate DoD and interagency exercises to ensure stakeholder involvement in system optimization and to leverage, to the fullest extent possible, all IMS data streams in informing partner exercise activities. - Analyze technical requirements for the addition of capabilities within the IMS infrastructure that will support nuclear-event response. - Advance nuclear treaty monitoring capabilities to higher technology readiness levels to establish a resilient, multi-mission, and state-of-the-art IMS capability. - Leverage conventional high-explosive testing events in order to increase opportunities to evaluate U.S. IMS performance. - Participate in CTBT Organization Provisional Technical Secretariat international/interagency- sponsored technology development exchanges to leverage expertise and to provide synergy for R&D activities. FY 2019 to FY 2020 Increase/Decrease Statement: The decrease from FY 2019 to FY 2020 is due to the realignment of Project RF-Forensics Technologies into Project RD-Nuclear Technologies and Capabilities Development as part of the Agency's RDT&E portfolio restructuring to bring greater agility and efficiency to programmatic and financial operations and better integrate refreshed organizational roles.											
Accomplishments/Planned Programs Subtotals							6.199	6.163	-	-	-
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 20/0602718BR/RF: Counter Weapons of Mass Destruction Applied Research	6.803	10.257	-	-	-	-	-	-	-	Continuing	Continuing
• 28/0603160BR/RF: Counter Weapons of Mass Destruction Advanced Technology Development	25.535	33.578	-	-	-	-	-	-	-	Continuing	Continuing
Remarks											

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605000BR / <i>*Counter Weapons of Mass Destruction Systems Development</i>	Project (Number/Name) RF / <i>Forensics Technologies</i>
<u>D. Acquisition Strategy</u> Assess government, academic, and industrial performers and make selections based upon a "best fit for task" criteria. Common government awardees include DoD Service Laboratories and the Department of Energy National Laboratories. <u>E. Performance Metrics</u> The goal of the NACT RDT&E program is to enable full compliance of all emerging data availability/data quality requirements and other operational requirements as documented in nuclear CTBT treaty requirements, nuclear-event response requirements, language, CTBT-issued Radionuclide and Waveform Operations Manuals, other CTBT Organization communications, and DoD Treaty Implementation Manager directives. The IMS data availability/timeliness performance specifications are currently 98% data availability for IMS waveform and 95% for IMS radionuclide systems. The data quality specifications are various data metrics that allow accurate time, location, and yield estimation of a nuclear event. RDT&E is conducted in support of the NACT's operational mission to operate, maintain, and sustain the Provisional Technical Secretariat certified waveform and radionuclide CTBT IMS monitoring stations and radionuclide laboratory in accordance with CTBT requirements at the lowest cost. CTBT IMS data availability/timeliness performance specifications are currently 98% data availability for IMS waveform and 95% for IMS radionuclide systems. Data quality metrics continue to evolve as the entire CTBT IMS capability is exercised and tested.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Defense Threat Reduction Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0605000BR / *Counter Weapons of Mass Destruction Systems Development						Project (Number/Name) RF / Forensics Technologies			
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Radionuclide sensor, station, laboratory and network improvements	FFRDC	Pacific Northwest National Laboratory : Richland, WA	5.951	1.582	Jan 2018	1.550	Jan 2019	-		-		-	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements; validation and verification testing	FFRDC	Sandia National Laboratory : Albuquerque, NM	5.594	1.827	Jan 2018	1.850	Jan 2019	-		-		-	Continuing	Continuing	-
Radionuclide sensor, station, and network improvements	MIPR	Air Force Technical Application Center : Patrick AFB, FL	2.630	0.724	Nov 2017	0.250	Nov 2018	-		-		-	Continuing	Continuing	-
Engineering & Technical Services	C/CPFF	Engility Corp : Chantilly, VA	1.986	-		-		-		-		-	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements	C/CPFF	Dynetics, Inc : Arlington, VA	1.828	-		-		-		-		-	Continuing	Continuing	-
Radionuclide sensor, station, laboratory and network improvements	C/CPFF	General Dynamics Misson Systems, Inc. : Fairfax, VA	2.048	0.441	Dec 2017	0.431	Nov 2018	-		-		-	Continuing	Continuing	-
Station, and network Improvements	C/CPFF	Leidos Innovations Corp. : Alexandria, VA	0.466	0.250	Apr 2018	0.200	Apr 2019	-		-		-	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements	C/CPFF	Pennsylvania State University : State College, PA	0.802	0.180	Jan 2018	0.200	Jan 2019	-		-		-	Continuing	Continuing	-
Station failure and logistics modeling and simulation	C/CPFF	Systems Exchange, Inc. : Carmel, CA	0.274	0.039	Jul 2018	-		-		-		-	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements	MIPR	Naval Research Laboratory : Washington DC	0.204	-		0.200	Jan 2019	-		-		-	Continuing	Continuing	-
EIF Readiness Planning	C/CPFF	Alion Science and Technology Corp. : McLean, VA	0.300	-		0.100	Jan 2019	-		-		-	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Defense Threat Reduction Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0605000BR / *Counter Weapons of Mass Destruction Systems Development						Project (Number/Name) RF / Forensics Technologies			
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Radionuclide sensor, station, laboratory and network improvements	C/CPFF	Raytheon Company : Dulles, VA	0.200	-		-		-		-		-	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements	C/CPFF	University of Alaska Fairbanks : Fairbanks, AK	0.330	0.129	Mar 2018	0.129	Mar 2019	-		-		-	Continuing	Continuing	-
IMEA Software Development	C/CPFF	Applied Research Associates, Inc. : Alexandria, VA	-	0.200	Dec 2017	0.200	Dec 2018	-		-		-	Continuing	Continuing	-
IMS Gas Background Analysis	FFRDC	Argonne National Laboratory : Argonne, IL	-	0.130	Apr 2018	0.100	Apr 2019	-		-		-	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements; validation and verification testing	C/TBD	TBD : TBD	-	-		0.295	May 2019	-		-		-	Continuing	Continuing	-
Seismic and Infrasound sensor, station, and network Improvements	MIPR	US Army Corps of Engineers : Vicksburg, MS	0.032	0.139	Mar 2018	0.100	Dec 2018	-		-		-	Continuing	Continuing	-
Subtotal			22.645	5.641		5.605		-		-		-	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
A&AS Support to Program Office	C/CPFF	Engility Corp. : Chantilly, VA	1.026	0.446	Dec 2017	0.446	Dec 2018	-		-		-	Continuing	Continuing	-
A&AS Support to Program Office	MIPR	OUSD AT&L : Arlington, VA	0.948	-		-		-		-		-	Continuing	Continuing	-
Travel	Reqn	Various : Ft. Belvoir, VA	0.550	0.112	Nov 2017	0.112	Nov 2018	-		-		-	Continuing	Continuing	-
Subtotal			2.524	0.558		0.558		-		-		-	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Defense Threat Reduction Agency											Date: March 2019						
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0605000BR / *Counter Weapons of Mass Destruction Systems Development					Project (Number/Name) RF / Forensics Technologies							
					Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals					25.169	6.199		6.163		-		-		-	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Defense Threat Reduction Agency										Date: March 2019			
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0605000BR / *Counter Weapons of Mass Destruction Systems Development					Project (Number/Name) RF / Forensics Technologies			

	FY 2011				FY 2012				FY 2013				FY 2014				FY 2015				FY 2016				FY 2017			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
NACT																												
Optimize and improve IMS seismic, infrasound, and radionuclide sensors: infrasound calibration standards, procedures, instrumentation																												
Optimize and improve IMS seismic, infrasound, and radionuclide sensors: automated seismic calibration process																												
Optimize and improve IMS seismic, infrasound, and radionuclide sensors: radionuclide system improvements to address detection limits and cost effectiveness																												
Optimize and improve IMS station performance: validation and verification testing of RDTE concepts to enable operational implementation																												
Provide analysis of 800 additional nuclear material samples for treaty verification purposes																												

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
NACT																												
Optimize and improve IMS seismic, infrasound, and radionuclide sensors: infrasound calibration standards, procedures, instrumentation																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Defense Threat Reduction Agency	Date: March 2019
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Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605000BR / *Counter Weapons of Mass Destruction Systems Development	Project (Number/Name) RF / Forensics Technologies
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	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Optimize and improve IMS seismic, infrasound, and radionuclide sensors: automated seismic calibration process																												
Optimize and improve IMS seismic, infrasound, and radionuclide sensors: radionuclide system improvements to address detection limits and cost effectiveness																												
Optimize and improve IMS station performance: validation and verification testing of RDTE concepts to enable operational implementation																												
Provide analysis of 800 additional nuclear material samples for treaty verification purposes																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605000BR / <i>*Counter Weapons of Mass Destruction Systems Development</i>	Project (Number/Name) RF / <i>Forensics Technologies</i>	

Schedule Details

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

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0605000BR / *Counter Weapons of Mass Destruction Systems Development				Project (Number/Name) MA / Mission Assurance Risk Management System			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
MA: Mission Assurance Risk Management System	-	0.000	0.000	5.600	-	5.600	5.500	5.500	5.500	5.500	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In an October 29, 2018 memorandum, the Deputy Secretary of Defense directed the transfer of Mission Assurance Risk Management System (MARMS) program management responsibilities from the Department of Defense Chief Management Officer (DoD CIO) to the Defense Threat Reduction Agency (DTRA), in light of DTRA's role in conducting Joint Mission Assurance Assessments. Funding for MARMS prior to FY 2020 is captured in Program Element 0605170D8Z.

A. Mission Description and Budget Item Justification

The Mission Assurance Risk Management System (MARMS) is a Department of Defense (DoD) risk management system that directly supports the Secretary of Defense's Mission Assurance (MA) responsibilities as defined in the DoD Directive (DoDD) 3020.40, Mission Assurance, with the objectives of creating resilience and supporting critical processes to enable the protection of assets and ensuring defense critical missions. MARMS will function as an integration framework spanning multiple security domains that will support risk-informed decision-making, resource investment, and improved synchronization at different levels within DoD. MARMS supports multiple Joint Capability Areas (JCA): Command and Control, Logistics, and Protection. MARMS is an acquisition category (ACAT) III software program and has a "high" impact value for each of the three security objectives (confidentiality, integrity, and availability) in accordance with DoD Instruction (DoDI) 8510.01 and the Committee on National Security Systems Instruction (CNSSI) 1253.

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

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: MA - Mission Assurance Risk Management System	0.000	0.000	5.600	0.000	5.600
Description: MARMS is a Department of Defense (DoD) risk management system that directly supports the Secretary of Defense's Mission Assurance (MA) responsibilities as defined in the DoD Directive (DoDD) 3020.40, Mission Assurance, with the objectives of creating resilience and supporting critical processes to enable the protection of assets and ensuring defense critical missions. MARMS Requirements Definition Package (RDP)-1 defines multiple spirals of major technological improvements. Each spiral is comprised of multiple Capability Drops (CD) that defined specific capabilities. RDP-1 defined 7 capability drops focusing on the collection, analysis, warehousing, sharing, protection, and accessing of Defense Critical Infrastructure (DCI) and AntiTerrorism (AT) data supporting multiple types and levels of trusted users.					
FY 2019 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency				Date: March 2019		
Appropriation/Budget Activity 0400 / 5		R-1 Program Element (Number/Name) PE 0605000BR / *Counter Weapons of Mass Destruction Systems Development		Project (Number/Name) MA / Mission Assurance Risk Management System		
B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Funding for MARMS prior to FY 2020 is captured in Program Element 0605170D8Z. FY 2020 Base Plans: - Continue System engineering and Agile Development per MARMS RDP-1. - Continue to improve capability of the Information Sharing Data Registry (CD1) and Mission Assurance Assessments (CD2) - Continue development of the Mission Assurance Viewer and Analysis Portal on SIPR (CD6) toward initial capability fielding in 4th Quarter FY22. - Continue the development effort of the Mission Assurance Workspace and Viewer on JWICS (CD5) toward initial capability fielding in 4th Quarter FY20. - Initiate the development effort of the Cross Domain Solutions (CDS) – Low to High (CD6) - Complete the MA Workspace and Viewer which will provide the department's leadership with a consolidated MA Dashboard and Analytical capabilities to perform planning and analysis of Mission Assurance activities per DODD 3020.40 and DODI 3020.45. FY 2020 OCO Plans: N/A FY 2019 to FY 2020 Increase/Decrease Statement: The increase from FY 2019 to FY 2020 is due to the functional transfer of MARMS from the Department of Defense Chief Information Officer (DoD CIO) to DTRA's core mission.						
Accomplishments/Planned Programs Subtotals		0.000	0.000	5.600	0.000	5.600
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks						
D. Acquisition Strategy N/A						
E. Performance Metrics N/A						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Defense Threat Reduction Agency												Date: March 2019			
Appropriation/Budget Activity 0400 / 5						R-1 Program Element (Number/Name) PE 0605000BR / *Counter Weapons of Mass Destruction Systems Development						Project (Number/Name) MA / Mission Assurance Risk Management System			
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MARMS	MIPR	U.S. Army Armament Research, Development and Engineering Center (ARDEC) : Picatinny, NJ	-	-		-		5.600		-		5.600	Continuing	Continuing	-
Subtotal			-	-		-		5.600		-		5.600	Continuing	Continuing	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-		0.000		5.600		-		5.600	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605000BR / *Counter Weapons of Mass Destruction Systems Development	Project (Number/Name) MA / Mission Assurance Risk Management System	

	FY 2011				FY 2012				FY 2013				FY 2014				FY 2015				FY 2016				FY 2017			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Capability Drop 1: Information Sharing																												
Development																												
Modernization and Integration																												
Capability Drop 2: Assessment Capability																												
Development																												
Modernization and Integration																												
Capability Drop 3: System Upgrades																												
Development																												
Modernization and Integration																												
Capability Drop 4: Workspace/Viewer on SIPR																												
Development																												
Modernization and Integration																												
Capability Drop 5: Workspace/Viewer on JWICS																												
Development																												
Modernization and Integration																												
Capability Drop 6: Cross Domain Solution - Low to High																												
Development																												
Modernization and Integration																												
Capability Drop 7: Cross Domain Solution - High to Low																												
Development																												
Modernization and Integration																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Defense Threat Reduction Agency										Date: March 2019			
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0605000BR / *Counter Weapons of Mass Destruction Systems Development					Project (Number/Name) MA / Mission Assurance Risk Management System			

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Capability Drop 1: Information Sharing																												
Development																												
Modernization and Integration																												
Capability Drop 2: Assessment Capability																												
Development																												
Modernization and Integration																												
Capability Drop 3: System Upgrades																												
Development																												
Modernization and Integration																												
Capability Drop 4: Workspace/Viewer on SIPR																												
Development																												
Modernization and Integration																												
Capability Drop 5: Workspace/Viewer on JWICS																												
Development																												
Modernization and Integration																												
Capability Drop 6: Cross Domain Solution - Low to High																												
Development																												
Modernization and Integration																												
Capability Drop 7: Cross Domain Solution - High to Low																												
Development																												
Modernization and Integration																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Defense Threat Reduction Agency			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0605000BR / *Counter Weapons of Mass Destruction Systems Development	Project (Number/Name) MA / Mission Assurance Risk Management System	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Capability Drop 1: Information Sharing				
Development	4	2017	3	2019
Modernization and Integration	1	2020	4	2022
Capability Drop 2: Assessment Capability				
Development	1	2018	3	2019
Modernization and Integration	1	2020	4	2022
Capability Drop 3: System Upgrades				
Development	1	2018	4	2020
Modernization and Integration	1	2021	4	2022
Capability Drop 4: Workspace/Viewer on SIPR				
Development	2	2018	4	2020
Modernization and Integration	1	2021	4	2022
Capability Drop 5: Workspace/Viewer on JWICS				
Development	1	2019	4	2020
Modernization and Integration	1	2021	4	2022
Capability Drop 6: Cross Domain Solution - Low to High				
Development	1	2020	4	2021
Modernization and Integration	1	2021	4	2022
Capability Drop 7: Cross Domain Solution - High to Low				
Development	1	2021	4	2022
Modernization and Integration	1	2023	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Defense Threat Reduction Agency	Date: March 2019
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Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide / BA 6: RDT&E Management Support					R-1 Program Element (Number/Name) PE 0605502BR / Small Business Innovation Research							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	59.541	11.311	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
RA: Information Sciences and Applications	59.541	11.311	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

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

A. Mission Description and Budget Item Justification

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

B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	11.311	0.000	0.000	-	0.000
Total Adjustments	11.311	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	11.311	-			

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

Project: RA: Information Sciences and Applications

Congressional Add: N/A

	FY 2018	FY 2019
	0.000	-
Congressional Add Subtotals for Project: RA	0.000	-
Congressional Add Totals for all Projects	0.000	-

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Defense Threat Reduction Agency		Date: March 2019
Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide / BA 6:</i> <i>RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605502BR / <i>Small Business Innovation Research</i>	

Change Summary Explanation

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

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency										Date: March 2019		
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605502BR / Small Business Innovation Research				Project (Number/Name) RA / Information Sciences and Applications			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RA: Information Sciences and Applications	59.541	11.311	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

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

A. Mission Description and Budget Item Justification

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

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

								FY 2018	FY 2019	FY 2020
Title: RA: Information Sciences and Applications								11.311	-	-
Description: This project provides the means for stimulating technological innovation in the private sector, strengthens the role of small business in meeting the DoD research and development needs; fosters and encourages participation of minority and disadvantaged businesses in technological innovation; and increases the commercial application of the DoD supported research and development results. These efforts are responsive to Public Law 106-554.										
Accomplishments/Planned Programs Subtotals								11.311	-	-
								FY 2018	FY 2019	
Congressional Add: N/A								0.000	-	
FY 2018 Accomplishments: N/A										
Congressional Adds Subtotals								0.000	-	

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Defense Threat Reduction Agency								Date: March 2019			
Appropriation/Budget Activity 0400 / 6				R-1 Program Element (Number/Name) PE 0605502BR / <i>Small Business Innovation Research</i>				Project (Number/Name) RA / <i>Information Sciences and Applications</i>			

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

<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u> <u>Base</u>	<u>FY 2020</u> <u>OCO</u>	<u>FY 2020</u> <u>Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 20/0602718BR/RA: <i>Counter Weapons of Mass Destruction Applied Research</i>	40.189	30.603	46.317	0.000	46.317	48.032	49.312	49.896	58.703	Continuing	Continuing
• 28/0603160BR/RA: <i>Counter Weapons of Mass Destruction Advanced Technology Development</i>	17.732	11.286	34.825	0.000	34.825	30.722	32.739	35.660	37.254	Continuing	Continuing
• 105/0604775BR/RA: <i>Advanced Component Development and Prototypes</i>	0.000	0.000	14.021	0.000	14.021	12.564	6.800	6.800	6.700	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A