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Department of Defense Fiscal Year (FY) 2021 Budget Estimates

February 2020



Army

Justification Book of
Research, Development, Test & Evaluation, Army
RDT&E – Volume III, Budget Activity 6

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Army • Budget Estimates FY 2021 • RDT&E Program

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RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY
APPROPRIATION LANGUAGE

For expenses necessary for basic and applied scientific research, development, test and evaluation, including maintenance, rehabilitation, lease, and operation of facilities and equipment, \$12,770,165,000.00 to remain available for obligation until September 30, 2022.

COST STATEMENT

The following Justification Books were prepared at a cost of \$460,861: Aircraft (ACFT), Missiles (MSLS), Weapons & Tracked Combat Vehicles (WTCV), Ammunition (AMMO), Other Procurement Army (OPA) 1 – Tactical & Support Vehicles, Other Procurement Army (OPA) 2 – Communications & Electronics, Other Procurement Army (OPA) 3 & 4 - Other Support Equipment & Spares, Research, Development, Test and Evaluation (RDTE) for: Budget Activity 1, Budget Activity 2, Budget Activity 3, Budget Activity 4, Budget Activity 5A, Budget Activity 5B, Budget Activity 5C, Budget Activity 6, Budget Activity 7, and Budget Activity 8.

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FY 2021 RDT&E, ARMY PROGRAM ELEMENT DESCRIPTIVE SUMMARIES
Introduction and Explanation of Contents

1. **General.** The purpose of this document is to provide summary information concerning the Research, Development, Test and Evaluation, Army program. The descriptive summaries are comprised of R-2 (Army RDT&E Budget Item Justification – program element level), R-2A (Army RDT&E Budget Item Justification – project level), R-3 (Army RDT&E Cost Analysis), R-4 (Schedule Profile Detail) and R-5 (Termination Liability Funding for MDAPs) Exhibits, which provide narrative information on all RDT&E program elements and projects through FY 2020.
2. **Relationship of the FY 2021 Budget Submitted to Congress to the FY 2020 Budget Submitted to Congress.** This paragraph provides a list of program elements/projects that are major new starts, restructures, developmental transitions, and terminated programs. Explanations for these changes can be found in the narrative sections of the Program Element R-2A Exhibits.

New Start Programs:

<i>Budget Activity</i>	<i>OSDPE / Project</i>	<i>Project Title</i>
02	0602115A / EB2	HIV Biomedical Technology
02	0602134A / CD2	Counter Improvised-Threat Advanced Studies
02	0602146A / AQ2	EW Techniques Technology
02	0602146A / AQ7	High Tempo Data Driven Decision Tools Technology
03	0603002A / MP3	Phys Chem Toxicity Assessment Sys Adv Tech
03	0603115A / EB3	HIV Medical Development
03	0603134A / CD3	Counter Improvised-Threat Simulation
03	0603463A / AQ8	High Tempo Data Driven Decision Tools Adv Tech
03	0603463A / AR8	Sensing in Contested Environments Adv Tech
03	0603463A / AU2	Optimization of Geospatial Data for Visualization
03	0603463A / AV1	GEOInt/Ops Logistics Integration-Planning Adv Tech
03	0603463A / AW6	Modular GPS Independent Sensors Advanced Tech
03	0603920A / CD5	Humanitarian Demining
04	0603804A / EW8	Armored Engineer Vehicles
04	0604115A / AX3	Technology Maturation Initiatives

04	0604134A / CD4	Counter Improvised-Threat Demonstration
05	0304270A / FJ5	Terrestrial Layer System (MIP)
05	0604601A / S64	Common Remotely Operated Wpn Sys (CROWS)
05	0604604A / BX8	Cold Weather All-Terrain Vehicle (CATV)
05	0604622A / E50	TRAILER DEVELOPMENT
05	0604802A / XT2	40mm Door Breach
05	0605145A / CD6	Medical Products and Support Systems Development
06	0605801A / M23	US Army Corps of Engineers Base Operations
06	0606105A / CD7	Medical Program-Wide Activities
07	0203802A / VV2	TOW
07	0607145A / FD5	Apache Product Improvement
07	0203802A / VT9	Lethal Miniature Aerial Missile System (LMAMS)

Program Element/Project Restructures:

<u>Budget Activity</u>	<u>Old OSDPE / Project: Title</u>	<u>New OSDPE / Project</u>
02	0602141A / AH5: Projectile and Multi-Function Warhead Technologies	0602143A/AY6, 0602145A/BK5
02	0602143A / AN1: Narrowband SATCOM Technology	0602146A/BZ6, 060346A/AN2
02	0602143A / BE1: Support Technology to Mission Command	0602146A/AQ9
02	0602144A / BL4: Countermine Technology	0602145A/BF9
02	0602145A / BH2: C4ISR Modular Autonomy Technology	0602145A/BF9
02	0602145A / BH7: Enhanced VETRONICS Technology	0602145A/BH5
02	0602145A / BJ3: Hydrogen Based Combat System Technology	0602145A/BH5
02	0602145A / BJ7: Detection of Explosive Hazards Technology	0602145A/BF9
02	0602146A / AN3: Non Traditional Waveforms Technology	0603463A/AP6
02	0602146A / AV7: Atmospheric Modeling and Meterological Technology	0603772A/101
02	0602147A / AF5: Simulation and Aerostructures Technology	0602147A/AE7
02	0602147A / AF6: Structures Technology	0602147A/AE7
02	0602147A / AF7: Warhead Integration Technology	0602147A/AE7

02	0602147A / AF9: Precision and Accuracy Technology	0602147A/AE7
02	0602147A / AG1: Missile Electronics Technology	0602147A/AE7
02	0602147A / AG2: Information and Signal Processing Technology	0602147A/AE7
02	0602147A / AG8: Advanced Energetics Technology	0602141A/AH9
02	0602147A / AG9: Multiple Simul Engagement Technologies (MSET) Tech	0602148A/AK4
02	0602148A / AI7: Alternative Concept Engine Technology	0602148A/AM4
02	0602148A / AK1: UAS Survivability Technology	0603465A/AK3
02	0602148A / AK6: Advanced Rotorcraft Armaments Protection System Te	0603465A/AK7, 0633465A/CA8
02	0602148A / AM2: Aircraft and Aircrew Protection Technology	0602148A/AJ4
02	0602150A / AD7: Missile Fire Control Sensors Technology	0602150A/AD3
02	0602787A / 874: Cbt Casualty Care Tech	0602787A/MM4
03	0603002A / MG4: Tech Base/Enabling Res in Mil Occup Med Adv Tech	0603002A/MN7, MN9, MO3, MO8, MP3
03	0603002A / MM5: Tech Base/Enabling Res Combat Cas Care Adv Tech	0603002A/MN3, MN4, MN5, MO2, MO4, MO7
03	0603002A / MM9: Tech Base/Enabling Rsrch for Infect Dis Adv Tech	0603002A/MO9, 0602787A/MM8
03	0603002A / MN8: Drugs to Prevent and Treat Malaria Advanced Tech	0602787A/MM8
03	0603002A / MO3: Military Occupational Fitness Standards Adv Tech	0603002A/MN7
03	0603118A / AZ8: Soldier Squad Small Arms Armaments Adv Tech	0602143/AY8, 0603463A/AQ1
03	0603462A / BH3: C4ISR Modular Autonomy Advanced Technology	0603462A/BZ9
03	0603462A / BI1: Protection for Autonomous Systems Adv Tech	0603462A/BG7
03	0603462A / BJ6: Hydrogen Based Combat System Advanced Technology	0603462A/BH6
03	0603462A / BJ8: Detection of Explosive Hazards Advanced Technology	0602145A/BF9
03	0603463A / AR2: Energy Informed Operations Advanced Technology	0603465A/AM5
03	0603463A / AU6: Automated Analytics for Operational Environment AT	0602146/AT7
03	0603464A / AF4: Missile Simulation Advanced Technology	0602147/AF8
03	0603464A / AH3: Single Multi-mission Attack Missile Adv Tech	0603465A/AK5
03	0603464A / BS3: Strategic Missile Advanced Technology	0603464A/BY2
03	0603465A / AI6: Next Gen Tactical UAS TD Advanced Technology	0603465A
03	0603465A / AM3: Aircraft and Aircrew Protection Advanced Tech	0603465A/AJ5
03	0603466A / AC8: Low Cost Extended Range Air Defense Adv Tech	0603466A/AD4
04	1206120A / FJ8: Assured Positioning, Navigation and Timing (PNT)	0604120A/ED5, BV4

04	1206120A / FJ9: Dismounted A-PNT	0604120A/EH8
04	1206120A / FK2: Mounted A-PNT	0604120A/EJ2
04	1206120A / FK3: Anti-Jam Antenna	0604120A/EJ2
04	1206308A / FE5: Space And Missile Defense Integration	0603308A/990
04	0603639A / EB8: OWL for Small Caliber Ammunition	0604802A/EP4
04	0603639A / EC2: Adv Armor-Piercing (ADVAP) for Small Cal Ammo	0604802A/FL4
04	0603639A / EU3: .50 Caliber All-Purpose Tactical Cartridge (APTC)	0604802A/EU5
04	0604541A / BT1: Interoperability	0604541A/BT3, BT5
04	0604541A / BT4: Network Technology Maturation Initiatives (NTMI)	0604541A/BT5
05	0604798A / DY3: NIE Test & Evaluation	0604798A/DY7
05	0604798A / DZ6: Army Integration Management & Coordination	0605054A/FL7
06	0605326A / 33B: Soldier-Centered Analyses For Future Force	0605604A/675
07	1203142A / FE1: Dscs-Dcs (Phase II)	0303142A/253
07	1203142A / FE2: MILSATCOM System Engineering	0303142A/456
07	1203142A / FI8: Protected Anti-JAM Tactical SATCOM	0303142A/456
07	1208053A / FE7: Joint Tact Grd Station-P3I(MIP)	0208053A/635
07	0303028A / FG2: Counterintelligence & Human Intel Modernization	0607150A/BS5
07	0303028A / H13: Information Dominance Center (IDC) - Tiara	0607150A/BS5
07	0305232A / RA7: RQ-11 Raven (MIP)	0604101A/BR6, 0605205A/BR7

Program Terminations (including transfers to Procurement and Sustainment):

Budget Activity	OSDPE / Project	Project Title
02	0602146A / AN5	Protected SATCOM-WB Global SATCOM Inter Canc Tech
02	0602146A / AU5	Automated Analytics for Operational Environment
02	0602146A / AW5	Modular GPS Independent Sensors Technology
02	0602147A / AH2	Single Multi-mission Attack Missile (SMAM) Technol
02	0602213A / CY9	Decoy and Deterrence Technology
02	0602787A / VB4	System Biology And Network Science Technology
03	0603457A / 7CY	Decoy and Deterrence Advanced Technology

03	0603462A / BF5	Adv Lethality & Accuracy Sys for Med Cal Adv Tech
03	0603463A / AW2	Autonomous Navigation Advanced Technology
03	0603464A / AE6	Strategic Long Range Cannon Advanced Technology
03	0603465A / AI4	Joint Multi-Role (JMR) Demonstration Advanced Tech
03	0603465A / AL6	Degraded Vis Environ Mitigation (DVE-M) Adv Tech
04	1206120A / FK1	PSEUDOLITES
04	0603804A / G11	Adv Elec Energy Con Ad
04	0604115A / AX8	Adv Leth and Accuracy Sys for Med Calber (ALAS-MC)
04	0604644A / MR1	Mobile Intermediate Range Missile
05	0604201A / EW7	Degraded Visual Environment
05	0604601A / FI2	Lightweight 30mm Cannon
05	0604710A / L76	Dismounted Fire Support Laser Targeting Systems
05	0604802A / ED7	Advanced Multipurpose (AMP) Cartridge
05	0604802A / EU7	Enhanced L lethality Cannon Munitions
05	0604804A / FG4	Ultra-Lightweight Camouflage Net System (ULCANS)
05	0604804A / L43	ENGINEER SUPPORT EQUIPMENT - ED
05	0604827A / S65	Platoon Power Generator
05	0604852A / XU9	Active Protection System
05	0604854A / 509	LIGHTWEIGHT 155M HOWITZER
05	0605013A / 193	Medical Communications For Combat Casualty
05	0605013A / XV6	Army Leader Dashboard
05	0605029A / EQ2	IntegGrdSecSurvRespC(IGSSR-C)
05	0605034A / EQ4	Tactical Security System (TSS)
05	0605036A / EQ5	Combating Weapons of Mass Destruction (CWMD)
05	0605049A / XT4	Advanced Threat Detection System (ATDS)
05	0605053A / FB2	Man Transportable Robotic System (MTRS) Inc II
05	0605053A / FB9	MTRS Standardization
06	0605805A / 857	DoD Explosives Safety Standards
06	0606001A / FD4	Military Ground-Based CREW Technology
07	0303150A / C86	Army Global C2 System

07	0305233A / RQ7	RQ-7 Shadow UAV
07	0307665A / FL5	Next Gen Biometric Collection Capability (MIP)
07	0607138A / ES5	Fixed Wing Product Improvement Program
07	0607665A / DT2	Non-MIP Biometrics

3. **Classification:** This document contains no classified data. Appropriately cleared individuals can obtain further information on Classified/Special Access Programs by contacting the Department of the Army.

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Department of Defense
FY 2021 President's Budget
Exhibit R-1 FY 2021 President's Budget
Total Obligation Authority
(Dollars in Thousands)

17 Jan 2020

Appropriation	FY 2019 (Base + OCO)			FY 2020 Base Enacted			FY 2020 Emergency			FY 2020 OCO Enacted			FY 2020 Total Enacted (Base+Emerg+ OCO)		
	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Research, Development, Test & Eval, Army	11,371,268			12,543,435						147,304			12,690,739		
Total Research, Development, Test & Evaluation	11,371,268			12,543,435						147,304			12,690,739		

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Department of Defense
FY 2021 President's Budget
Exhibit R-1 FY 2021 President's Budget
Total Obligational Authority
(Dollars in Thousands)

17 Jan 2020

Appropriation	FY 2021 Base	FY 2021 OCO for Base Requirements	FY 2021 OCO for Direct War and Enduring Costs	FY 2021 Total OCO	FY 2021 Total (Base + OCO)
	-----	-----	-----	-----	-----
Research, Development, Test & Eval, Army	12,587,343		182,824	182,824	12,770,167
Total Research, Development, Test & Evaluation	12,587,343		182,824	182,824	12,770,167

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Department of Defense
 FY 2021 President's Budget
 Exhibit R-1 FY 2021 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

17 Jan 2020

Summary Recap of Budget Activities	FY 2019 (Base + OCO)	FY 2020 Base Enacted	FY 2020 Emergency	FY 2020 OCO Enacted	FY 2020 Total Enacted (Base+Emerg+ OCO)
Basic Research	491,263	574,484			574,484
Applied Research	1,553,764	1,259,374			1,259,374
Advanced Technology Development	1,561,576	1,531,516			1,531,516
Advanced Component Development & Prototypes	1,213,569	2,975,681			2,986,795
System Development & Demonstration	3,119,552	2,989,779			3,089,926
Management Support	1,710,179	1,368,475			1,875
Operational Systems Development	1,721,365	1,844,126			34,168
Software and Digital Technology Pilot Programs					
Total Research, Development, Test & Evaluation	11,371,268	12,543,435			147,304
Summary Recap of FYDP Programs					
General Purpose Forces	646,373	765,324			765,324
Intelligence and Communications	311,699	236,563			37,368
Research and Development	10,090,836	11,139,975			109,936
Central Supply and Maintenance	106,766	108,348			108,348
Administration and Associated Activities	358				
Space	209,281	285,952			285,952
Classified Programs	5,955	7,273			7,273
Total Research, Development, Test & Evaluation	11,371,268	12,543,435			147,304
					12,690,739

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Department of Defense
FY 2021 President's Budget
Exhibit R-1 FY 2021 President's Budget
Total Obligational Authority
(Dollars in Thousands)

17 Jan 2020

Summary Recap of Budget Activities	FY 2021 Base	FY 2021 OCO for Base Requirements	Direct War and Enduring Costs	FY 2021 Total OCO	FY 2021 Total (Base + OCO)
Basic Research	463,359				463,359
Applied Research	920,881	2,000		2,000	922,881
Advanced Technology Development	1,203,590				1,203,590
Advanced Component Development & Prototypes	3,421,608	2,520		2,520	3,424,128
System Development & Demonstration	3,199,798	97,825		97,825	3,297,623
Management Support	1,333,123	5,137		5,137	1,338,260
Operational Systems Development	1,998,539	75,342		75,342	2,073,881
Software and Digital Technology Pilot Programs	46,445				46,445
Total Research, Development, Test & Evaluation	12,587,343	182,824		182,824	12,770,167
Summary Recap of FYDP Programs					
General Purpose Forces	923,370	2,300		2,300	925,670
Intelligence and Communications	309,698	76,942		76,942	386,640
Research and Development	11,289,280	103,582		103,582	11,392,862
Central Supply and Maintenance	61,012				61,012
Administration and Associated Activities					
Space					
Classified Programs	3,983				3,983
Total Research, Development, Test & Evaluation	12,587,343	182,824		182,824	12,770,167

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Department of the Army
 FY 2021 President's Budget
 Exhibit R-1 FY 2021 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

17 Jan 2020

Summary Recap of Budget Activities	FY 2019 (Base + OCO)	FY 2020 Base Enacted	FY 2020 Emergency	FY 2020 OCO Enacted	FY 2020 Total Enacted (Base+Emerg+ OCO)
Basic Research	491,263	574,484			574,484
Applied Research	1,553,764	1,259,374			1,259,374
Advanced Technology Development	1,561,576	1,531,516			1,531,516
Advanced Component Development & Prototypes	1,213,569	2,975,681			11,114 2,986,795
System Development & Demonstration	3,119,552	2,989,779			100,147 3,089,926
Management Support	1,710,179	1,368,475			1,875 1,370,350
Operational Systems Development	1,721,365	1,844,126			34,168 1,878,294
Software and Digital Technology Pilot Programs					
Total Research, Development, Test & Evaluation	11,371,268	12,543,435			147,304 12,690,739
Summary Recap of FYDP Programs					
General Purpose Forces	646,373	765,324			765,324
Intelligence and Communications	311,699	236,563			37,368 273,931
Research and Development	10,090,836	11,139,975			109,936 11,249,911
Central Supply and Maintenance	106,766	108,348			108,348
Administration and Associated Activities	358				
Space	209,281	285,952			285,952
Classified Programs	5,955	7,273			7,273
Total Research, Development, Test & Evaluation	11,371,268	12,543,435			147,304 12,690,739

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Department of the Army
 FY 2021 President's Budget
 Exhibit R-1 FY 2021 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

17 Jan 2020

Summary Recap of Budget Activities	FY 2021 Base	FY 2021 OCO for Base Requirements	FY 2021 OCO for Direct War and Enduring Costs	FY 2021 Total OCO	FY 2021 Total (Base + OCO)
Basic Research	463,359			2,000	463,359
Applied Research	920,881				922,881
Advanced Technology Development	1,203,590				1,203,590
Advanced Component Development & Prototypes	3,421,608		2,520	2,520	3,424,128
System Development & Demonstration	3,199,798		97,825	97,825	3,297,623
Management Support	1,333,123		5,137	5,137	1,338,260
Operational Systems Development	1,998,539		75,342	75,342	2,073,881
Software and Digital Technology Pilot Programs	46,445				46,445
Total Research, Development, Test & Evaluation	12,587,343		182,824	182,824	12,770,167

Summary Recap of FYDP Programs

General Purpose Forces	923,370	2,300	2,300	925,670
Intelligence and Communications	309,698	76,942	76,942	386,640
Research and Development	11,289,280	103,582	103,582	11,392,862
Central Supply and Maintenance	61,012	61,012	61,012	
Administration and Associated Activities				
Space				
Classified Programs	3,983			3,983
Total Research, Development, Test & Evaluation	12,587,343	182,824	182,824	12,770,167

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Department of the Army
 FY 2021 President's Budget
 Exhibit R-1 FY 2021 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

Appropriation: 2040A Research, Development, Test & Eval, Army

Line Element No	Program Item Number	Item	Act (Base + OCO)	FY 2019 (Base + OCO)	FY 2020 Base Enacted	FY 2020 Emergency	FY 2020 OCO Enacted	FY 2020 Total Enacted	S (Base+Emerg+ OCO)
1	0601101A	In-House Laboratory Independent Research	01	11,391				11,391	U
2	0601102A	Defense Research Sciences	01	306,347		354,480		354,480	U
3	0601103A	University Research Initiatives	01	62,813		87,858		87,858	U
4	0601104A	University and Industry Research Centers	01	110,712		127,164		127,164	U
5	0601121A	Cyber Collaborative Research Alliance	01		4,982		4,982	4,982	U
		Basic Research		491,263	574,484			574,484	
6	0602105A	Materials Technology	02	79,432				79,432	U
7	0602115A	Biomedical Technology	02					69,961	U
8	0602120A	Sensors and Electronic Survivability	02	90,023				30,819	U
9	0602122A	TRACTOR HIP	02		8,674			145,900	U
10	0602126A	TRACTOR JACK	02		400			143,899	U
11	0602134A	Counter Improvised-Threat Advanced Studies	02					263,547	U
12	0602141A	Lethality Technology	02					138,016	U
13	0602142A	Army Applied Research	02					138,016	U
14	0602143A	Soldier Lethality Technology	02					145,900	U
15	0602144A	Ground Technology	02					143,899	U
16	0602145A	Next Generation Combat Vehicle Technology	02					263,547	U
17	0602146A	Network C3I Technology	02					138,016	U

R-121PB: FY 2021 President's Budget (Published Version), as of January 17, 2020 at 11:58:58

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Department of the Army
 FY 2021 President's Budget
 Exhibit R-1 FY 2021 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

Appropriation: 2040A Research, Development, Test & Eval, Army

Line Element No	Program Number	Item	Act	FY 2021			FY 2021		
				FY 2021 Base	FY 2021 OCO for Requirements	OCO for Direct War and Enduring Costs	FY 2021 Total OCO	FY 2021 Total (Base + OCO)	S e
1	0601101A	In-House Laboratory Independent Research	01						U
2	0601102A	Defense Research Sciences	01	303,257				303,257	U
3	0601103A	University Research Initiatives	01	67,148				67,148	U
4	0601104A	University and Industry Research Centers	01	87,877				87,877	U
5	0601121A	Cyber Collaborative Research Alliance	01	5,077				5,077	U
		Basic Research		463,359				463,359	
6	0602105A	Materials Technology	02						U
7	0602115A	Biomedical Technology	02	11,835				11,835	U
8	0602120A	Sensors and Electronic Survivability	02						U
9	0602122A	TRACTOR HTP	02						U
10	0602126A	TRACTOR JACK	02						U
11	0602134A	Counter Improvised-Threat Advanced Studies	02	2,000				2,000	U
12	0602141A	Lethality Technology	02	42,425				42,425	U
13	0602142A	Army Applied Research	02	30,757				30,757	U
14	0602143A	Soldier Lethality Technology	02	125,435				125,435	U
15	0602144A	Ground Technology	02	28,047				28,047	U
16	0602145A	Next Generation Combat Vehicle Technology	02	217,565			2,000	219,565	U
17	0602146A	Network C3I Technology	02	114,404				114,404	U

R-121PB: FY 2021 President's Budget (Published Version), as of January 17, 2020 at 11:58:58

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Department of the Army
 FY 2021 President's Budget
 Exhibit R-1 FY 2021 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

17 Jan 2020

Appropriation: 2040A Research, Development, Test & Eval, Army

Program Line Element No Number	Item	Act	FY 2019 (Base + OCO)	FY 2020 Base Enacted	FY 2020 Emergency	FY 2020 OCO Enacted	FY 2020 Total Enacted	S (Base+Emerg+ OCO)
18 0602147A	Long Range Precision Fires Technology	02			120,327		120,327	U
19 0602148A	Future Verticle Lift Technology	02			98,359		98,359	U
20 0602150A	Air and Missile Defense Technology	02			95,771		95,771	U
21 0602211A	Aviation Technology	02	80,424					U
22 0602213A	C3I Applied Cyber	02			18,947		18,947	U
23 0602270A	Electronic Warfare Technology	02	25,127					U
24 0602303A	Missile Technology	02	90,496					U
25 0602307A	Advanced Weapons Technology	02	43,454					U
26 0602308A	Advanced Concepts and Simulation	02	28,623					U
27 0602601A	Combat Vehicle and Automotive Technology	02	102,899					U
28 0602618A	Ballistics Technology	02	86,737					U
29 0602622A	Chemical, Smoke and Equipment Defeating Technology	02	4,884					U
30 0602623A	Joint Service Small Arms Program	02	11,890					U
31 0602624A	Weapons and Munitions Technology	02	379,833					U
32 0602705A	Electronics and Electronic Devices	02	98,855					U
33 0602709A	Night Vision Technology	02	33,218					U
34 0602712A	Countermine Systems	02	26,594					U
35 0602716A	Human Factors Engineering Technology	02	23,755					U
36 0602720A	Environmental Quality Technology	02	15,364					U

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Line Element No	Program Number	Item	Act	FY 2021 OCO for Direct War and Enduring Costs			FY 2021 OCO for Direct War and Enduring Costs		
				FY 2021 Base Requirements	FY 2021 OCO for Base Requirements	FY 2021 Total OCO	FY 2021 Total OCO	FY 2021 Total OCO + OCO	FY 2021 Total OCO + OCO
18	0602147A	Long Range Precision Fires Technology	02	60,553				60,553	U
19	0602148A	Future Verticle Lift Technology	02		96,484			96,484	U
20	0602150A	Air and Missile Defense Technology	02		56,298			56,298	U
21	0602211A	Aviation Technology	02						U
22	0602213A	C3I Applied Cyber	02		18,816			18,816	U
23	0602270A	Electronic Warfare Technology	02						U
24	0602303A	Missile Technology	02						U
25	0602307A	Advanced Weapons Technology	02						U
26	0602308A	Advanced Concepts and Simulation	02						U
27	0602601A	Combat Vehicle and Automotive Technology	02						U
28	0602618A	Ballistics Technology	02						U
29	0602622A	Chemical, Smoke and Equipment Defeating Technology	02						U
30	0602623A	Joint Service Small Arms Program	02						U
31	0602624A	Weapons and Munitions Technology	02						U
32	0602705A	Electronics and Electronic Devices	02						U
33	0602709A	Night Vision Technology	02						U
34	0602712A	Countermeasures Systems	02						U
35	0602716A	Human Factors Engineering Technology	02						U
36	0602720A	Environmental Quality Technology	02						U

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Line Element No Number	Item	Program	FY 2019	FY 2020	FY 2020	FY 2020	FY 2020	FY 2020	FY 2020
			Act (Base + OCO)	Base Enacted	Emergency	OCO Enacted	Total Enacted	Total Enacted	(Base+Emerg+ eOCO)
37 0602782A	Command, Control, Communications Technology	02	51,685						U
38 0602783A	Computer and Software Technology	02	14,622						U
39 0602784A	Military Engineering Technology	02	96,922						U
40 0602785A	Manpower/Personnel/Training Technology	02	17,157		20,873		20,873		U
41 0602786A	Warfighter Technology	02	55,467						U
42 0602787A	Medical Technology	02	87,229		112,955		112,955		U
	Applied Research		1,553,-	1,259,-	374			1,259,	374
43 0603001A	Warfighter Advanced Technology	03	40,501						U
44 0603002A	Medical Advanced Technology	03	94,575		83,030		83,030		U
45 0603003A	Aviation Advanced Technology	03	165,035						U
46 0603004A	Weapons and Munitions Advanced Technology	03	240,862						U
47 0603005A	Combat Vehicle and Automotive Advanced Technology	03	171,448						U
48 0603006A	Space Application Advanced Technology	03	48,542						U
49 0603007A	Manpower, Personnel and Training Advanced Technology	03	6,270		11,038		11,038		U
50 0603009A	TRACTOR HIKE	03	22,631						U
51 0603015A	Next Generation Training & Simulation Systems	03	27,711						U
52 0603115A	Medical Development	03							U

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				FY Base	OCO Requirements	OCO for Base Requirements	Direct War and Enduring Costs	Total OCO	(Base + OCO)
37	0602782A	Command, Control, Communications Technology	02	-----	-----	-----	-----	-----	-----
38	0602783A	Computer and Software Technology	02	-----	-----	-----	-----	-----	U
39	0602784A	Military Engineering Technology	02	-----	-----	-----	-----	-----	U
40	0602785A	Manpower/Personnel/Training Technology	02	20,766	-----	-----	-----	20,766	U
41	0602786A	Warfighter Technology	02	-----	-----	-----	-----	-----	U
42	0602787A	Medical Technology	02	95,496	-----	-----	-----	95,496	U
		Applied Research		920,881	-----	-----	2,000	922,881	-----
43	0603001A	Warfighter Advanced Technology	03	-----	-----	-----	-----	-----	U
44	0603002A	Medical Advanced Technology	03	38,896	-----	-----	-----	38,896	U
45	0603003A	Aviation Advanced Technology	03	-----	-----	-----	-----	-----	U
46	0603004A	Weapons and Munitions Advanced Technology	03	-----	-----	-----	-----	-----	U
47	0603005A	Combat Vehicle and Automotive Advanced Technology	03	-----	-----	-----	-----	-----	U
48	0603006A	Space Application Advanced Technology	03	-----	-----	-----	-----	-----	U
49	0603007A	Manpower, Personnel and Training Advanced Technology	03	11,659	-----	-----	-----	11,659	U
50	0603009A	TRACTOR HIKE	03	-----	-----	-----	-----	-----	U
51	0603015A	Next Generation Training & Simulation Systems	03	-----	-----	-----	-----	-----	U
52	0603115A	Medical Development	03	27,723	-----	-----	-----	27,723	U
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53 0603117A	Army Advanced Technology Development	03			66,338		66,338	U
54 0603118A	Soldier Lethality Advanced Technology	03			135,968		135,968	U
55 0603119A	Ground Advanced Technology	03			136,793		136,793	U
56 0603125A	Combating Terrorism - Technology Development	03	43,910					U
57 0603130A	TRACTOR NAIL	03	4,896					U
58 0603131A	TRACTOR EGGS	03	6,041					U
59 0603134A	Counter Improvised-Threat Simulation	03						U
60 0603270A	Electronic Warfare Technology	03	40,461					U
61 0603313A	Missile and Rocket Advanced Technology	03	92,404					U
62 0603322A	TRACTOR CAGE	03	16,845					U
63 0603457A	C3I Cyber Advanced Development	03			23,769		23,769	U
64 0603461A	High Performance Computing Modernization Program	03	211,457		224,755		224,755	U
65 0603462A	Next Generation Combat Vehicle Advanced Technology	03			260,535		260,535	U
66 0603463A	Network C3I Advanced Technology	03			142,899		142,899	U
67 0603464A	Long Range Precision Fires Advanced Technology	03			189,386		189,386	U
68 0603465A	Future Vertical Lift Advanced Technology	03			174,892		174,892	U

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Line Element No	Program Number	Item	Act	FY 2021			FY 2021			S
				FY 2021 Base	FY 2021 OCO for Requirements	Direct War and Enduring Costs	Total OCO	Total (Base + OCO)	e	
53	0603117A	Army Advanced Technology Development	03	62,663				62,663	U	
54	0603118A	Soldier Lethality Advanced Technology	03	109,608				109,608	U	
55	0603119A	Ground Advanced Technology	03	14,795				14,795	U	
56	0603125A	Combating Terrorism - Technology Development	03						U	
57	0603130A	TRACTOR NAIL	03						U	
58	0603131A	TRACTOR EGGS	03						U	
59	0603134A	Counter Improvised-Threat Simulation	03	25,000				25,000	U	
60	0603270A	Electronic Warfare Technology	03						U	
61	0603331A	Missile and Rocket Advanced Technology	03						U	
62	0603322A	TRACTOR CAGE	03						U	
63	0603457A	C3I Cyber Advanced Development	03	23,357				23,357	U	
64	0603461A	High Performance Computing Modernization Program	03	188,024				188,024	U	
65	0603462A	Next Generation Combat Vehicle Advanced Technology	03	199,358				199,358	U	
66	0603463A	Network C3I Advanced Technology	03	158,608				158,608	U	
67	0603464A	Long Range Precision Fires Advanced Technology	03	121,060				121,060	U	
68	0603465A	Future Vertical Lift Advanced Technology	03	156,194				156,194	U	

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Line Element No Program Number	Item	Act (Base + OCO) -----	FY 2019 -----	FY 2020 Base Enacted -----	FY 2020 Emergency -----	OCCO Enacted -----	FY 2020 Total Enacted (Base+Emerg+ OCO) -----
			-----	-----	-----	-----	-----
69 0603466A	Air and Missile Defense Advanced Technology	03					82,113 U
70 0603606A	Landmine Warfare and Barrier Advanced Technology	03	16,860				U
71 0603607A	Joint Service Small Arms Program	03	22,628				U
72 0603710A	Night Vision Advanced Technology	03	69,094				U
73 0603728A	Environmental Quality Technology Demonstrations	03	28,079				U
74 0603734A	Military Engineering Advanced Technology	03	100,359				U
75 0603772A	Advanced Tactical Computer Science and Sensor Technology	03	45,799				U
76 0603794A	C3 Advanced Technology	03	45,168				U
77 0603920A	Humanitarian Demining	03					U
78 0603305A	Advanced Technology Development	04	1,561,576	1,531,516			1,531,516
79 0603308A	Army Space Systems Integration	04					
80 0603327A	Air and Missile Defense Systems Engineering	04	44,743	52,480			52,980 U
81 0603619A	Landmine Warfare and Barrier - Adv Dev	04	40,255	82,915			82,915 U
82 0603627A	Smoke, Obscurant and Target Defeating Sys-Adv Dev	04	19,852				U
83 0603639A	Tank and Medium Caliber Ammunition	04	40,358	77,696			77,696 U

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Line Element No	Program Number	Item	Act	FY 2021			FY 2021		
				FY 2021 Base	FY 2021 Requirements	OCO for Direct War and Enduring Costs	FY 2021 Total OCO	FY 2021 Total (Base + OCO)	
69	0603466A	Air and Missile Defense Advanced Technology	03	58,130				58,130	U
70	0603606A	Landmine Warfare and Barrier Advanced Technology	03						U
71	0603607A	Joint Service Small Arms Program	03						U
72	0603710A	Night Vision Advanced Technology	03						U
73	0603728A	Environmental Quality Technology Demonstrations	03						U
74	0603734A	Military Engineering Advanced Technology	03						U
75	0603772A	Advanced Tactical Computer Science and Sensor Technology	03						U
76	0603794A	C3 Advanced Technology	03						U
77	0603920A	Humanitarian Demining	03	8,515				8,515	U
78	0603305A	Advanced Technology Development Army Missle Defense Systems Integration	04	11,062				11,062	U
79	0603308A	Army Space Systems Integration	04	26,230				26,230	U
80	0603327A	Air and Missile Defense Systems Engineering	04	26,482			500	26,982	U
81	0603619A	Landmine Warfare and Barrier - Adv Dev	04	64,092				64,092	U
82	0603627A	Smoke, Obscurant and Target Defeating Sys-Adv Dev	04						U
83	0603639A	Tank and Medium Caliber Ammunition	04	92,753				92,753	U

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Line Element No Number	Program Item	FY 2019		FY 2020		FY 2020		FY 2020	
		(Base + OCO)	Act	Base Enacted	Emergency	OCCO Enacted	Total Enacted S (Base+Emerg+ e OCO)		
84 0603645A	Armored System Modernization - Adv Dev	04	80,106	144,234			144,234	U	
85 0603747A	Soldier Support and Survivability	04	8,067	6,514		3,000	9,514	U	
86 0603766A	Tactical Electronic Surveillance System - Adv Dev	04	35,667	37,490			37,490	U	
87 0603774A	Night Vision Systems Advanced Development	04	7,072	200,791			200,791	U	
88 0603779A	Environmental Quality Technology - Dem/Val	04	14,190	19,561			19,561	U	
89 0603790A	NATO Research and Development	04	3,564	5,406			5,406	U	
90 0603801A	Aviation - Adv Dev	04	93,885	505,890			505,890	U	
91 0603804A	Logistics and Engineer Equipment - Adv Dev	04	18,845	6,254		1,085	7,339	U	
92 0603807A	Medical Systems - Adv Dev	04	38,371	36,975			36,975	U	
93 0603827A	Soldier Systems - Advanced Development	04	30,384	26,113			26,113	U	
94 0604017A	Robotics Development	04	70,745	84,381			84,381	U	
95 0604020A	Cross Functional Team (CFT) Advanced Development & Prototyping	04	8,225					U	
96 0604021A	Electronic Warfare Technology Maturational (MIP)	04				23,043	U		
97 0604035A	Low Earth Orbit (LEO) Satellite Capability	04					U		
98 0604100A	Analysis Of Alternatives	04	9,396	10,023			10,023	U	

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Program Line Element No	Item	Act	FY 2021			FY 2021		
			FY 2021 Base	OCO for Requirements	OCO for Direct War and Enduring Costs	Total OCO	S Total (Base + OCO)	e C
84 0603645A	Armored System Modernization - Adv Dev	04	151,478				151,478	U
85 0603747A	Soldier Support and Survivability	04		5,841			5,841	U
86 0603766A	Tactical Electronic Surveillance System - Adv Dev	04		194,775			194,775	U
87 0603774A	Night Vision Systems Advanced Development	04		24,316			24,316	U
88 0603779A	Environmental Quality Technology - Dem/Val	04		13,387			13,387	U
89 0603790A	NATO Research and Development	04		4,762			4,762	U
90 0603801A	Aviation - Adv Dev	04		647,937			647,937	U
91 0603804A	Logistics and Engineer Equipment - Adv Dev	04		4,761			4,761	U
92 0603807A	Medical Systems - Adv Dev	04		28,520			28,520	U
93 0603827A	Soldier Systems - Advanced Development	04		26,138			26,138	U
94 0604017A	Robotics Development	04		121,207			121,207	U
95 0604020A	Cross Functional Team (CFT) Advanced Development & Prototyping	04						
96 0604021A	Electronic Warfare Technology Maturation (MIP)	04		22,840			22,840	U
97 0604035A	Low Earth Orbit (LEO) Satellite Capability	04		22,678			22,678	U
98 0604100A	Analysis Of Alternatives	04		10,082			10,082	U

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	99 0604101A	Small Unmanned Aerial Vehicle (SUAV) (6.4)	04						U
100 0604113A	Future Tactical Unmanned Aircraft System (FTUAS)	04	12,393		40,745			40,745	U
101 0604114A	Lower Tier Air Missile Defense (LTAMD) Sensor	04	84,981		379,772			379,772	U
102 0604115A	Technology Maturation Initiatives	04	91,749		179,676			179,676	U
103 0604117A	Maneuver - Short Range Air Defense (M-SHORAD)	04	75,711		42,900			42,900	U
104 0604118A	TRACTOR BEAM	04	52,894		112,806			4,529	U
105 0604119A	Army Advanced Component Development & Prototyping	04						117,335	U
106 0604120A	Assured Positioning, Navigation and Timing (PNT)	04							U
107 0604121A	Synthetic Training Environment Refinement & Prototyping	04	39,890		103,621			103,621	U
108 0604134A	Counter Improvised-Threat Demonstration, Prototype Development, and Testing	04							U
109 0604182A	Hypersonics	04						404,000	U
110 0604319A	Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)	04	10,324						U
111 0604403A	Future Interceptor	04						2,000	U
112 0604541A	Unified Network Transport	04						29,700	U
113 0604644A	Mobile Medium Range Missile	04						5,000	U

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			FY 2021 Base	FY 2021 OCO for Requirements	OCO for Direct War and Enduring Costs	FY 2021 Total OCO	FY 2021 Total (Base + OCO)	-
99 0604101A	Small Unmanned Aerial Vehicle (SUAV) (6.4)	04	1,378				1,378	U
100 0604113A	Future Tactical Unmanned Aircraft System (FTUAS)	04	40,083				40,083	U
101 0604114A	Lower Tier Air Missile Defense (LTAMD) Sensor	04	376,373				376,373	U
102 0604115A	Technology Maturation Initiatives	04	156,834				156,834	U
103 0604117A	Maneuver - Short Range Air Defense (M-SHORAD)	04	4,995				4,995	U
104 0604118A	TRACTOR BEAM	04						U
105 0604119A	Army Advanced Component Development & Prototyping	04	170,490				170,490	U
106 0604120A	Assured Positioning, Navigation and Timing (PNT)	04	128,125				128,125	U
107 0604121A	Synthetic Training Environment Refinement & Prototyping	04	129,547				129,547	U
108 0604134A	Counter Improvised-Threat Demonstration, Prototype Development, and Testing	04	13,831				13,831	U
109 0604182A	Hypersonics	04	801,417				801,417	U
110 0604319A	Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)	04						U
111 604403A	Future Interceptor	04	7,992				7,992	U
112 604541A	Unified Network Transport	04	40,677				40,677	U
113 604644A	Mobile Medium Range Missile	04						U

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114 0604785A	Integrated Base Defense (Budget Activity 4)		04					2,000	2,000	U
115 0305251A	Cyberpace Operations Forces and Force Support		04	52,817		52,102			52,102	U
116 1206120A	Assured Positioning, Navigation and Timing (PNT)		04	123,364		139,110			139,110	U
117 1206308A	Army Space Systems Integration		04	45,420		104,996			104,996	U
	Advanced Component Development & Prototypes			1,213,569		2,975,681			2,986,795	
118 0604201A	Aircraft Avionics		05	31,401		8,414			8,414	U
119 0604270A	Electronic Warfare Development		05	56,310		59,539			59,539	U
120 0604328A	TRACTOR CAGE		05	27,050						U
121 0604601A	Infantry Support Weapons		05	74,629		87,179			87,179	U
122 0604604A	Medium Tactical Vehicles		05	3,905						U
123 0604611A	JAVELIN		05	5,250		14,997			14,997	U
124 0604622A	Family of Heavy Tactical Vehicles		05	11,182		13,125			13,125	U
125 0604633A	Air Traffic Control		05	11,580		5,781			5,781	U
126 0604642A	Light Tactical Wheeled Vehicles		05	1,013		2,965			2,965	U
127 0604645A	Armored Systems Modernization (ASM) - Eng Dev		05	359,017		285,136			285,136	U
128 0604710A	Night Vision Systems - Eng Dev		05	139,337		143,696			143,696	U
129 0604713A	Combat Feeding, Clothing, and Equipment		05	4,393		7,393			7,393	U

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				FY Base	OCO Requirements	OCO for Direct War and Enduring Costs	Total OCO	Total (Base + OCO)	S Total	e Total	c Total	-
114 0604785A	Integrated Base Defense (Budget Activity 4)		04			2,020	2,020	2,020	2,020	2,020	U	-
115 0305251A	Cyberspace Operations Forces and Force Support		04	50,525					50,525	50,525	U	-
116 1206120A	Assured Positioning, Navigation and Timing (PNT)		04								U	-
117 1206308A	Army Space Systems Integration		04								U	-
	Advanced Component Development & Prototypes			3,421,608			2,520	2,520	2,520	3,424,128		-
118 0604201A	Aircraft Avionics		05	2,764						2,764	U	-
119 0604270A	Electronic Warfare Development		05	62,426						62,426	U	-
120 0604328A	TRACTOR CAGE		05								U	-
121 0604601A	Infantry Support Weapons		05	91,574						91,574	U	-
122 0604604A	Medium Tactical Vehicles		05	8,523						8,523	U	-
123 0604611A	JAVELIN		05	7,493						7,493	U	-
124 0604622A	Family of Heavy Tactical Vehicles		05	24,792						24,792	U	-
125 0604633A	Air Traffic Control		05	3,511						3,511	U	-
126 0604642A	Light Tactical Wheeled Vehicles		05	1,976						1,976	U	-
127 0604645A	Armored Systems Modernization (ASM) - Eng Dev		05	135,488						135,488	U	-
128 0604710A	Night Vision Systems - Eng Dev		05	61,445						61,445	U	-
129 0604713A	Combat Feeding, Clothing, and Equipment		05	2,814						2,814	U	-

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Line Element No Number	Program Item	Act (Base + OCO)	FY 2019 Base Enacted	FY 2020 Emergency	FY 2020 OCO Enacted	FY 2020 OCO (Base+Emerg+ OCO)	Total Enacted S (Base+Emerg+ OCO)
130 0604715A	Non-System Training Devices - Eng Dev	05	42,604	30,912			30,912 U
131 0604741A	Air Defense Command, Control and Intelligence - Eng Dev	05	208,965	33,502			33,502 U
132 0604742A	Constructive Simulation Systems Development	05	21,354	11,636			11,636 U
133 0604746A	Automatic Test Equipment Development	05	10,104	10,915			10,915 U
134 0604760A	Distributive Interactive Simulations (DIS) - Eng Dev	05	8,423	7,801			7,801 U
135 0604768A	Brilliant Anti-Armor Submunition (BAT)	05	6,568	20,000			20,000 U
136 0604780A	Combined Arms Tactical Trainer (CATT) Core	05	20,514	9,241			9,241 U
137 0604798A	Brigade Analysis, Integration and Evaluation	05	48,030	38,303			38,303 U
138 0604802A	Weapons and Munitions - Eng Dev	05	173,713	186,323			186,323 U
139 0604804A	Logistics and Engineer Equipment - Eng Dev	05	70,096	107,826			107,826 U
140 0604805A	Command, Control, Communications Systems - Eng Dev	05	15,366	12,595			12,595 U
141 0604807A	Medical Materiel/Medical Biological Defense Equipment - Eng Dev	05	45,054	48,264			48,264 U
142 0604808A	Landmine Warfare/Barrier - Eng Dev	05	39,261	37,108			37,108 U
143 0604818A	Army Tactical Command & Control Hardware & Software	05	163,229	129,974			129,974 U
144 0604820A	Radar Development	05	37,847	95,720			95,720 U

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 (Dollars in Thousands)

Appropriation: 2040A Research, Development, Test & Eval, Army

Line Element No	Program Number	Item	Act	FY 2021			FY 2021		
				FY 2021 Base	FY 2021 OCO for Requirements	FY 2021 Direct War and Enduring Costs	Total OCO	Total (Base + OCO)	S e C
130	0604715A	Non-System Training Devices - Eng Dev	05	28,036				28,036	U
131	0604741A	Air Defense Command, Control and Intelligence - Eng Dev	05	43,651		27,000	27,000	70,651	U
132	0604742A	Constructive Simulation Systems Development	05	10,150				10,150	U
133	0604746A	Automatic Test Equipment Development	05	5,578				5,578	U
134	0604760A	Distributive Interactive Simulations (DIS) - Eng Dev	05	7,892				7,892	U
135	0604768A	Brilliant Anti-Armor Submunition (BAT)	05	24,975				24,975	U
136	0604780A	Combined Arms Tactical Trainer (CATT) Core	05	3,568				3,568	U
137	0604798A	Brigade Analysis, Integration and Evaluation	05	19,268				19,268	U
138	0604802A	Weapons and Munitions - Eng Dev	05	265,811				265,811	U
139	0604804A	Logistics and Engineer Equipment - Eng Dev	05	49,694				49,694	U
140	0604805A	Command, Control, Communications Systems - Eng Dev	05	11,079				11,079	U
141	0604807A	Medical Materiel/Medical Biological Defense Equipment - Eng Dev	05	49,870				49,870	U
142	0604808A	Landmine Warfare/Barrier - Eng Dev	05	9,589				9,589	U
143	0604818A	Army Tactical Command & Control Hardware & Software	05	162,513				162,513	U
144	0604820A	Radar Development	05	109,259				109,259	U

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Appropriation: 2040A Research, Development, Test & Eval, Army

Line Element No	Program Item	Act (Base + OCO)	FY 2019 (Base + OCO)	FY 2020 Base Enacted	FY 2020 Emergency	FY 2020 OCO Enacted	FY 2020 Total Enacted	Total Enacted S (Base+Emerg+ e OCO) C
145 0604822A	General Fund Enterprise Business System (GFEBS)	05	35,468	42,883			42,883	U
146 0604823A	Firefinder	05	25,856	17,294			17,294	U
147 0604827A	Soldier Systems – Warrior Dem/Val	05	10,044	4,803			4,803	U
148 0604852A	Suite of Survivability Enhancement Systems – EMD	05	50,380	85,198			85,198	U
149 0604854A	Artillery Systems – EMD	05	1,722	10,732			10,732	U
150 0605013A	Information Technology Development	05	74,551	88,689			88,689	U
151 0605018A	Integrated Personnel and Pay System-Army (IPPS-A)	05	158,807	102,073			102,073	U
152 0605028A	Armored Multi-Purpose Vehicle (AMPV)	05	107,521	83,830			83,830	U
153 0605029A	Integrated Ground Security Surveillance Response Capability (IGSSR-C)	05	3,104	6,699			6,699	U
154 0605030A	Joint Tactical Network Center (JTNC)	05	15,287	15,882			15,882	U
155 0605031A	Joint Tactical Network (JTN)	05	42,134	40,808			40,808	U
156 0605032A	TRACTOR TIRE	05	107,926					U
157 0605033A	Ground-Based Operational Surveillance System – Expeditionary (GBOSS-E)	05	4,980	3,847			3,847	U
158 0605034A	Tactical Security System (TSS)	05	4,326	6,928			6,928	U
159 0605035A	Common Infrared Countermeasures (CIRCM)	05	32,025	23,179			23,179	U
160 0605036A	Combating Weapons of Mass Destruction (CWMD)	05	10,883	10,000			10,000	U

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Line Element No	Program Item	Act	FY 2021			FY 2021			FY 2021 S Total (Base + OCO) C
			FY 2021 Base	OCO for Requirements	Direct War and Enduring Costs	Total OCO	OCO	OCO	
145	0604822A General Fund Enterprise Business System (GFEBS)	05	21,201						21,201 U
146	0604823A Firefinder	05	20,008						20,008 U
147	0604827A Soldier Systems – Warrior Dem/Val	05	6,534						6,534 U
148	0604852A Suite of Survivability Enhancement Systems – EMD	05	82,459						82,459 U
149	0604854A Artillery Systems – EMD	05	11,611						11,611 U
150	0605013A Information Technology Development	05	142,678						142,678 U
151	0605018A Integrated Personnel and Pay System-Army (IPPS-A)	05	115,286						115,286 U
152	0605028A Armored Multi-Purpose Vehicle (AMPV)	05	96,594						96,594 U
153	0605029A Integrated Ground Security Surveillance Response Capability (IGSSR-C)	05							U
154	0605030A Joint Tactical Network Center (JTNC)	05	16,264						16,264 U
155	0605031A Joint Tactical Network (JTN)	05	31,696						31,696 U
156	0605032A TRACTOR TIRE	05							U
157	0605033A Ground-Based Operational Surveillance System – Expeditionary (GOBSS-E)	05	5,976						5,976 U
158	0605034A Tactical Security System (TSS)	05							U
159	0605035A Common Infrared Countermeasures (CIRCM)	05	23,321						25,621 U
160	0605036A Combating Weapons of Mass Destruction (CWMD)	05							U

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Program Line Element No	Item Number	Act	FY 2019 (Base + OCO)	FY 2020 Base Enacted	FY 2020 Emergency	OCCO Enacted	FY 2020 (Base+Emerg+ OCO)	Total Enacted S (Base+Emerg+ e OCO) C
161 0605038A	Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite	05	14,517	6,054			6,054	U
162 0605041A	Defensive CYBER Tool Development	05	33,796	50,662			50,662	U
163 0605042A	Tactical Network Radio Systems (Low-Tier)	05	18,761	28,404			28,404	U
164 0605047A	Contract Writing System	05	40,341	17,082			17,082	U
165 0605049A	Missile Warning System Modernization (MWSM)	05	7,321	1,539			1,539	U
166 0605051A	Aircraft Survivability Development	05	56,067	55,057			77,420	132,477 U
167 0605052A	Indirect Fire Protection Capability Inc 2 - Block 1	05	92,674	194,366			194,366	U
168 0605053A	Ground Robotics	05	65,311	26,104			26,104	U
169 0605054A	Emerging Technology Initiatives	05	46,451	37,696			37,696	U
170 0605145A	Medical Products and Support Systems Development	05						
171 0605203A	Army System Development & Demonstration	05						
172 0605205A	Small Unmanned Aerial Vehicle (SUAV) (6.5)	05						
173 0605380A	AMF Joint Tactical Radio System (JTRS)	05	15,379					
174 0605450A	Joint Air-to-Ground Missile (JAGM)	05	12,440	6,585			6,585	U
175 0605457A	Army Integrated Air and Missile Defense (AIAMD)	05	318,850	208,638			208,638	U

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Line Element No	Program Item	Act	FY 2021			FY 2021			FY 2021 S Total e
			FY Base	OCO for Requirements	OCO for Direct War and Enduring Costs	Total OCO	(Base + OCO)	C	
161 0605038A	Nuclear Biological Chemical Reconnaissance Vehicle (NBCRIV) Sensor Suite	05	4,846						4,846 U
162 0605041A	Defensive CYBER Tool Development	05	28,544						28,544 U
163 0605042A	Tactical Network Radio Systems (Low-Tier)	05	28,178						28,178 U
164 0605047A	Contract Writing System	05	22,860						22,860 U
165 0605049A	Missile Warning System Modernization (MWSM)	05							U
166 0605051A	Aircraft Survivability Development	05	35,893			64,625			100,518 U
167 0605052A	Indirect Fire Protection Capability Inc 2 - Block 1	05	235,770						235,770 U
168 0605053A	Ground Robotics	05	13,710						13,710 U
169 0605054A	Emerging Technology Initiatives	05	294,739						294,739 U
170 0605145A	Medical Products and Support Systems Development	05	954						954 U
171 0605203A	Army System Development & Demonstration	05	150,201						150,201 U
172 0605205A	Small Unmanned Aerial Vehicle (SUAV) (6.5)	05	5,999						5,999 U
173 0605380A	AMF Joint Tactical Radio System (JTRS)	05							U
174 0605450A	Joint Air-to-Ground Missile (JAGM)	05	8,891						8,891 U
175 0605457A	Army Integrated Air and Missile Defense (AIAMD)	05	193,929						193,929 U

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Appropriation: 2040A Research, Development, Test & Eval, Army

Program	Line Element	Item	Act FY 2019 (Base + OCO)	FY 2020 Base Enacted	FY 2020 Emergency	FY 2020 OCO Enacted	FY 2020 Total Enacted (Base+Emerg+ OCO)	FY 2020 Total Enacted S (Base+Emerg+ OCO)
No	Number	Item	Act ---	FY 2020 Base Enacted -----	FY 2020 Emergency -----	FY 2020 OCO Enacted -----	FY 2020 Total Enacted (Base+Emerg+ OCO) -----	FY 2020 Total Enacted S (Base+Emerg+ OCO) -----
176	0605625A	Manned Ground Vehicle	05	205,620			205,620	U
177	0605766A	National Capabilities Integration (MIP)	05	12,340	7,835		7,835	U
178	0605812A	Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph	05	7,232			7,232	U
179	0605830A	Aviation Ground Support Equipment	05	7,616	1,664		1,664	U
180	0303032A	TROJAN - RH12	05	5,721	3,936		3,936	U
181	0303267A	Auctioned Spectrum Relocation Fund	05	18,381				U
182	0303367A	Spectrum Access Research and Development	05	285				U
183	0304270A	Electronic Warfare Development	05	8,922	15,232		3,200	18,432 U
184	1205117A	Tractor Bears	05	23,170				U
		System Development & Demonstration	3,119,552	2,989,779			100,147	3,089,926
185	0604256A	Threat Simulator Development	06	46,732	42,117			42,117 U
186	0604258A	Target Systems Development	06	31,286	28,327			28,327 U
187	0604759A	Major T&E Investment	06	79,214	146,565			146,565 U
188	0605103A	Rand Arroyo Center	06	19,071	13,113			13,113 U
189	0605301A	Army Kwajalein Atoll	06	237,414	238,691			238,691 U
190	0605326A	Concepts Experimentation Program	06	30,667	36,922			36,922 U
191	0605502A	Small Business Innovative Research	06	303,386				U
192	0605601A	Army Test Ranges and Facilities	06	311,027	336,468			336,468 U

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Line Element No	Program Number	Item	Act	FY 2021			FY 2021			S Total (Base + OCO) C
				FY Base	OCO Requirements	OCO for Baseline and Enduring Costs	Total OCO	Direct War		
176	0605625A	Manned Ground Vehicle	05	327,732						327,732 U
177	0605766A	National Capabilities Integration (MIP)	05	7,670						7,670 U
178	0605812A	Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph	05	1,742						1,742 U
179	0605830A	Aviation Ground Support Equipment	05	1,467						1,467 U
180	0303032A	TROJAN - RH12	05	3,451						3,451 U
181	0303267A	Auctioned Spectrum Relocation Fund	05							U
182	0303367A	Spectrum Access Research and Development	05							U
183	0304270A	Electronic Warfare Development	05	55,855			3,900			
184	1205117A	Tractor Bears	05							U
		System Development & Demonstration		3,199,798			97,825			3,297,623
185	0604256A	Threat Simulator Development	06	14,515						14,515 U
186	0604258A	Target Systems Development	06	10,668						10,668 U
187	0604759A	Major T&E Investment	06	106,270						106,270 U
188	0605103A	Rand Arroyo Center	06	13,481						13,481 U
189	0605301A	Army Kwajalein Atoll	06	231,824						231,824 U
190	0605326A	Concepts Experimentation Program	06	54,898						54,898 U
191	0605502A	Small Business Innovative Research	06							U
192	0605601A	Army Test Ranges and Facilities	06	350,359						350,359 U

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Program	Line Element No	Item	FY 2019 (Base + OCO) Act	FY 2020 Base Enacted	FY 2020 Emergency	FY 2020 OCO Enacted	FY 2020 Total Enacted (Base+Emerg+ OCO)	Total S (Base+Emerg+ OCO)
	193 0605602A	Army Technical Test Instrumentation and Targets	06	82,617	61,974		61,974	U
	194 0605604A	Survivability/Lethality Analysis	06	39,886	35,075		35,075	U
	195 0605606A	Aircraft Certification	06	3,796	3,461		3,461	U
	196 0605702A	Meteorological Support to RDT&E Activities	06	9,495	6,233		6,233	U
	197 0605706A	Materiel Systems Analysis	06	21,043	21,342		21,342	U
	198 0605709A	Exploitation of Foreign Items	06	15,026	11,168		11,168	U
	199 0605712A	Support of Operational Testing	06	52,139	52,723		52,723	U
	200 0605716A	Army Evaluation Center	06	56,532	60,815		60,815	U
	201 0605718A	Army Modeling & Sim X-Cmd Collaboration & Integ	06	2,708	2,527		2,527	U
	202 0605801A	Programwide Activities	06	60,218	58,175		58,175	U
	203 0605803A	Technical Information Activities	06	28,237	30,060		30,060	U
	204 0605805A	Munitions Standardization, Effectiveness and Safety	06	66,678	54,458		54,458	U
	205 0605857A	Environmental Quality Technology Mgmt Support	06	3,138	4,681		4,681	U
	206 0605898A	Army Direct Report Headquarters – R&D – MHA	06	53,526	53,820		53,820	U
	207 0606001A	Military Ground-Based CREW Technology	06	4,241	2,141		2,141	U
	208 0606002A	Ronald Reagan Ballistic Missile Defense Test Site	06	60,808	62,069		62,069	U

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Program Line Element No	Item	Act	FY 2021			FY 2021		
			FY 2021 Base	OCO for Requirements	OCO for Direct War and Enduring Costs	Total OCO	Total (Base + OCO)	-
193 0605602A	Army Technical Test Instrumentation and Targets	06	48,475				48,475	U
194 0605604A	Survivability/Lethality Analysis	06	36,001				36,001	U
195 0605606A	Aircraft Certification	06	2,736				2,736	U
196 0605702A	Meteorological Support to RDT&E Activities	06	6,488				6,488	U
197 0605706A	Materiel Systems Analysis	06	21,859				21,859	U
198 0605709A	Exploitation of Foreign Items	06	7,936			1,000	8,936	U
199 0605712A	Support of Operational Testing	06	54,470				54,470	U
200 0605716A	Army Evaluation Center	06	63,141				63,141	U
201 0605718A	Army Modeling & Sim X-Cmd Collaboration & Integ	06	2,572				2,572	U
202 0605801A	Programwide Activities	06	87,472				87,472	U
203 0605803A	Technical Information Activities	06	26,244				26,244	U
204 0605805A	Munitions Standardization, Effectiveness and Safety	06	40,133				40,133	U
205 0605857A	Environmental Quality Technology Mgmt Support	06	1,780				1,780	U
206 0605898A	Army Direct Report Headquarters - R&D - MHA	06	55,045				55,045	U
207 0606001A	Military Ground-Based CREW Technology	06	06				U	
208 0606002A	Ronald Reagan Ballistic Missile Defense Test Site	06	71,306				71,306	U

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Line Element No Number	Item	Program	Act (Base + OCO)	FY 2019 (Base + OCO)	FY 2020 Base Enacted	FY 2020 Emergency	OCCO Enacted	FY 2020	Total Enacted S (Base+Emerg+ e OCO)
209 0606003A	CounterIntel and Human Intel Modernization	06	2,636	1,050				1,875	2,925 U
210 0606105A	Medical Program-Wide Activities	06							U
211 0606942A	Assessments and Evaluations Cyber Vulnerabilities	06	88,300	4,500				4,500	U
212 0909980A	Judgment Fund Reimbursement	06	122						U
213 0909999A	Financing for Cancelled Account Adjustments	06	236						U
	Management Support		1,710,179	1,368,475				1,875	1,370,350
214 0603778A	MLRS Product Improvement Program	07	6,574	14,615				14,615	U
215 0603813A	TRACTOR FULL	07	4,067						U
216 0605024A	Anti-Tamper Technology Support	07	7,159	8,491				8,491	U
217 0607131A	Weapons and Munitions Product Improvement Programs	07	17,992	15,645				15,645	U
218 0607133A	TRACTOR SMOKE	07	12,357						U
219 0607134A	Long Range Precision Fires (LRPF)	07	152,573	156,682				156,682	U
220 0607135A	Apache Product Improvement Program	07	22,914						U
221 0607136A	Blackhawk Product Improvement Program	07	33,906	23,039				23,039	U
222 0607137A	Chinook Product Improvement Program	07	139,003	171,471				171,471	U
223 0607138A	Fixed Wing Product Improvement Program	07	2,146						U
224 0607139A	Improved Turbine Engine Program	07	173,766	206,434				206,434	U

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Line Element No	Program Item	Act	FY 2021			FY 2021		
			FY 2021 Base	OCO for Requirements	OCO for Direct War and Enduring Costs	Total OCO	S Total (Base + OCO)	e C
209 0606003A	CounterIntel and Human Intel Modernization	06	1,063		4,137	4,137	5,200	U
210 0606105A	Medical Program-Wide Activities	06		19,891			19,891	U
211 0606942A	Assessments and Evaluations Cyber Vulnerabilities	06		4,496			4,496	U
212 0909980A	Judgment Fund Reimbursement	06						U
213 0909999A	Financing for Cancelled Account Adjustments	06						U
	Management Support		1,333,123		5,137	5,137	1,338,260	
214 0603778A	MLRS Product Improvement Program	07	10,157				10,157	U
215 0603813A	TRACTOR PULL	07						U
216 0605024A	Anti-Tamper Technology Support	07		8,682			8,682	U
217 0607131A	Weapons and Munitions Product Improvement Programs	07	20,409				20,409	U
218 0607133A	TRACTOR SMOKE	07						U
219 0607134A	Long Range Precision Fires (LRPF)	07	122,733				122,733	U
220 0607135A	Apache Product Improvement Program	07						U
221 0607136A	Blackhawk Product Improvement Program	07	11,236				11,236	U
222 0607137A	Chinook Product Improvement Program	07	46,091				46,091	U
223 0607138A	Fixed Wing Product Improvement Program	07						U
224 0607139A	Improved Turbine Engine Program	07	249,257				249,257	U

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Line Element No	Program Item	FY 2019 (Base + OCO)	FY 2020 Base Enacted	FY 2020 Emergency	FY 2020 OCO Enacted	FY 2020 Total Enacted	Total Enacted S (Base+Emerg+ OCO)
225 0607142A	Aviation Rocket System Product Improvement and Development	07	35,211	1,927		1,927	U
226 0607143A	Unmanned Aircraft System Universal Products	07	36,488	18,132		18,132	U
227 0607145A	Apache Future Development	07		5,448		5,448	U
228 0607150A	Intel Cyber Development	07					U
229 0607312A	Army Operational Systems Development	07		45,026		45,026	U
230 0607665A	Family of Biometrics	07	2,320	1,702		1,702	U
231 0607865A	Patriot Product Improvement	07	72,895	87,430		87,430	U
232 0203728A	Joint Automated Deep Operation Coordination System (JADOCSS)	07	29,782	47,398		47,398	U
233 0203735A	Combat Vehicle Improvement Programs	07	321,513	277,633		277,633	U
234 0203743A	155mm Self-Propelled Howitzer Improvements	07	35,681	199,274		199,274	U
235 0203744A	Aircraft Modifications/Product Improvement Programs	07	13,629	9,278		9,278	U
236 0203752A	Aircraft Engine Component Improvement Program	07	146	144		144	U
237 0203758A	Digitization	07	6,077	5,270		5,270	U
238 0203801A	Missile/Air Defense Product Improvement Program	07	3,588	1,287		1,287	U
239 0203802A	Other Missile Product Improvement Programs	07	4,760				U
240 0203808A	TRACTOR CARD	07	34,050				U

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 Total Obligational Authority
 (Dollars in Thousands)

Appropriation: 2040A Research, Development, Test & Eval, Army

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Program Line Element No	Item	Act	FY 2021	FY 2021	FY 2021	FY 2021
			Base	OCO for Requirements	Direct War and Enduring Costs	Total (Base + OCO)
225 0607142A	Aviation Rocket System Product Improvement and Development	07	17,155			17,155 U
226 0607143A	Unmanned Aircraft System Universal Products	07	7,743			7,743 U
227 0607145A	Apache Future Development	07	77,177			77,177 U
228 0607150A	Intel Cyber Development	07	14,652			14,652 U
229 0607312A	Army Operational Systems Development	07	35,851			35,851 U
230 0607665A	Family of Biometrics	07	1,324			1,324 U
231 0607865A	Patriot Product Improvement	07	187,840			187,840 U
232 0203728A	Joint Automated Deep Operation Coordination System (JADOCs)	07	44,691			44,691 U
233 0203735A	Combat Vehicle Improvement Programs	07	268,919			268,919 U
234 0203743A	155mm Self-Propelled Howitzer Improvements	07	427,254			427,254 U
235 0203744A	Aircraft Modifications/Product Improvement Programs	07	11,688			11,688 U
236 0203752A	Aircraft Engine Component Improvement Program	07	80			80 U
237 0203758A	Digitization	07	4,516			4,516 U
238 0203801A	Missile/Air Defense Product Improvement Program	07	1,288			1,288 U
239 0203802A	Other Missile Product Improvement Programs	07	79,424			81,724 U
240 0203808A	TRACTOR CARD	07	2,300			2,300 U

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Program	Line Element No Number	Item	Act	FY 2019 (Base + OCO)	FY 2020 Base Enacted	FY 2020 Emergency	OCCO Enacted	FY 2020 Total Enacted (Base+Emerg+ OCO)	FY 2020 Total Enacted S (Base+Emerg+ OCO)
	241 0205402A	Integrated Base Defense – Operational System Dev	07	8,000				U	
	242 0205410A	Materials Handling Equipment	07	1,132				U	
	243 0205412A	Environmental Quality Technology – Operational System Dev	07	249	10,000			10,000	U
	244 0205456A	Lower Tier Air and Missile Defense (AMD) System	07	74,295	97,746			97,746	U
	245 0205778A	Guided Multiple-Launch Rocket System (GMLRS)	07	113,471	117,294			117,294	U
	246 0208053A	Joint Tactical Ground System	07					U	
	248 0303028A	Security and Intelligence Activities	07	40,002	13,845			12,904	26,749 U
	249 0303140A	Information Systems Security Program	07	40,148	25,710			25,710	U
	250 0303141A	Global Combat Support System	07	51,415	60,076			60,076	U
	251 0303142A	SATCOM Ground Environment (SPACE)	07					U	
	252 0303150A	WMMCCS/Global Command and Control System	07	1,966	2,073			2,073	U
	255 0305172A	Combined Advanced Applications	07	1,500				U	
	256 0305179A	Integrated Broadcast Service (IBS)	07	450	459			459	U
	257 0305204A	Tactical Unmanned Aerial Vehicles	07	6,000	5,097			17,050	22,147 U
	258 0305206A	Airborne Reconnaissance Systems	07	26,416	11,177			2,000	13,177 U
	259 0305208A	Distributed Common Ground/Surface Systems	07	27,109	28,821			28,821	U
	260 0305219A	MQ-1C Gray Eagle UAS	07		5,000			5,000	U

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Line Element No	Program Number	Item	Act	FY 2021			FY 2021		
				FY 2021 Base	FY 2021 OCO for Requirements	OCO for Direct War and Enduring Costs	FY 2021 Total OCO	FY 2021 Total (Base + OCO)	S e C
241	0205402A	Integrated Base Defense – Operational System Dev	07						U
242	0205410A	Materials Handling Equipment	07						U
243	0205412A	Environmental Quality Technology – Operational System Dev	07						U
244	0205456A	Lower Tier Air and Missile Defense (AMD) System	07						U
245	0205778A	Guided Multiple-Launch Rocket System (GMLRS)	07	75,575			75,575	75,575	U
246	0208053A	Joint Tactical Ground System	07	9,510			9,510	9,510	U
248	0303028A	Security and Intelligence Activities	07			23,367	23,367	23,367	U
249	0303140A	Information Systems Security Program	07	29,270			29,270	29,270	U
250	0303141A	Global Combat Support System	07	86,908			86,908	86,908	U
251	0303142A	SATCOM Ground Environment (SPACE)	07	18,684			18,684	18,684	U
252	0303150A	WMMCCS/Global Command and Control System	07						U
255	0305172A	Combined Advanced Applications	07						U
256	0305179A	Integrated Broadcast Service (IBS)	07	467			467	467	U
257	0305204A	Tactical Unmanned Aerial Vehicles	07	4,051		34,100	34,100	38,151	U
258	0305206A	Airborne Reconnaissance Systems	07	13,283		15,575	15,575	28,858	U
259	0305208A	Distributed Common Ground/Surface Systems	07	47,204				47,204	U
260	0305219A	MQ-1C Gray Eagle UAS	07						U

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Line Element No Number	Item	Act (Base + OCO)	FY 2020 Base Enacted	FY 2020 Emergency	FY 2020 OCO Enacted	FY 2020 Total Enacted (Base+Emerg+ OCO)
261 0305232A	RQ-11 UAV	07	6,180	3,218		3,218 U
262 0305233A	RQ-7 UAV	07	17,863	7,817		7,817 U
263 0307665A	Biometrics Enabled Intelligence	07	6,524	2,000		2,214 U
264 0708045A	End Item Industrial Preparedness Activities	07	106,766	108,348		108,348 U
265 1203142A	SATCOM Ground Environment (SPACE)	07	9,927	34,169		34,169 U
266 1208053A	Joint Tactical Ground System	07	7,400	7,677		7,677 U
9999 9999999999	Classified Programs		5,955	7,273		7,273 U
	Operational Systems Development		1,721,365	1,844,126		1,878,294
267 0608041A	Defensive CYBER - Software Prototype Development	08				
	Software and Digital Technology Pilot Program					
	Total Research, Development, Test & Eval, Army	11,371,268	12,543,435		147,304	12,690,739

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Appropriation: 2040A Research, Development, Test & Eval, Army

Line Element No. Number	Item	Act	FY 2021	FY 2021	FY 2021	FY 2021
			Base	OCO for Requirements	OCO for Base Requirements	Direct War and Enduring Costs
261 0305232A	RQ-11 UAV	07				
262 0305233A	RQ-7 UAV	07				
263 0307665A	Biometrics Enabled Intelligence	07				
264 0708045A	End Item Industrial Preparedness Activities	07	61,012			
265 1203142A	SATCOM Ground Environment (SPACE)	07				
266 1208053A	Joint Tactical Ground System	07				
9999 999999999 Classified Programs	Operational Systems Development	3,983 1,998,539		75,342	75,342	3,983 2,073,881
267 0608041A	Defensive CYBER - Software Prototype Development	08 46,445				46,445
	Software and Digital Technology Pilot Program	46,445				46,445
	Total Research, Development, Test & Eval, Army	12,587,343		182,824	182,824	12,770,167

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020			
Appropriation/Budget Activity					R-1 Program Element (Number/Name)									
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0604256A / Threat Simulator Development									
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost		
Total Program Element	-	46.732	42.117	14.515	-	14.515	14.807	14.125	7.343	11.236	0.000	150.875		
976: Army Threat Sim (ATS)	-	46.732	42.117	14.515	-	14.515	14.807	14.125	7.343	11.236	0.000	150.875		
A. Mission Description and Budget Item Justification														
This Program Element (PE) supports the design, development, acquisition, integration and fielding of realistic mobile threat simulators and realistic threat simulation products utilized in Army/Department of Defense (DoD) training and developmental and operational tests. This PE originally funded simulators representing Soviet equipment, but scope was expanded to address emerging world threats. Army Threat Simulator and Threat Simulation products are utilized to populate test battlefields for United States (U.S.) Army Test and Evaluation Command (ATEC), to conduct developmental and operational tests, and to support Program Executive Office (PEO) required user testing in System Integration Laboratories (SILs) and hardware/simulation in-the-loop facilities. These battlefield simulators represent adversary systems (e.g. missile systems, command, control and communications systems, electronic warfare systems, etc.) in order to portray a realistic threat environment during testing of U.S. weapon systems.														
Army Threat Simulator and Threat Simulation products developed or fielded under this PE support Army-wide, non-system-specific threat product requirements. Each capability is pursued in concert and coordination with existing Army/DoD and Tri-Service capabilities to eliminate duplication of effort. Simulator development is responsive to Office of the Secretary of Defense and Government Accountability Office guidance for the Army to conduct operational testing in a realistic threat environment. Actual threat equipment is acquired when appropriate (in lieu of development) and total package fielding is still required (i.e., instrumentation, operations and maintenance, manuals, new equipment training, etc.). Threat simulator development is accomplished under the auspices of the Project Manager for Instrumentation, Targets and Threat Simulators (PM ITTS) and the Director, Operational Test and Evaluation (DOT&E) Threat Simulator Investment Working Group.														
B. Program Change Summary (\$ in Millions)					FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total					
Previous President's Budget					47.322	14.117	15.229	-	15.229					
Current President's Budget					46.732	42.117	14.515	-	14.515					
Total Adjustments					-0.590	28.000	-0.714	-	-0.714					
• Congressional General Reductions					-	-								
• Congressional Directed Reductions					-	-								
• Congressional Rescissions					-	-								
• Congressional Adds					-	28.000								
• Congressional Directed Transfers					-	-								
• Reprogrammings					-	-								
• SBIR/STTR Transfer					-0.590	-								
• Adjustments to Budget Years					-	-	-0.714	-	-0.714					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0604256A / <i>Threat Simulator Development</i>	
Congressional Add Details (\$ in Millions, and Includes General Reductions)		FY 2019 FY 2020
Project: 976: <i>Army Threat Sim (ATS)</i>		
Congressional Add: <i>Integrated Threat Force Cyber Threat Simulators</i>		6.000 -
Congressional Add: <i>Threat Cyberspace Operations</i>		10.000 13.000
Congressional Add: <i>Cyber Security Operations Center</i>		18.500 15.000
		Congressional Add Subtotals for Project: 976
		Congressional Add Totals for all Projects
		34.500 28.000
		34.500 28.000

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 6					PE 0604256A / Threat Simulator Development				976 / Army Threat Sim (ATS)				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
976: Army Threat Sim (ATS)	-	46.732	42.117	14.515	-	14.515	14.807	14.125	7.343	11.236	0.000	150.875	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification													
This Project supports the design, development, acquisition, integration and fielding of realistic mobile threat simulators and realistic threat simulation products utilized in Army/Department of Defense (DoD) training and developmental and operational tests. This Project originally funded simulators representing Soviet equipment, but scope was expanded to address emerging world threats. Army Threat Simulator and Threat Simulation products are utilized to populate test battlefields for the United States (U.S.) Army Test and Evaluation Command (ATEC), to conduct developmental and operational tests, and to support Program Executive Office (PEO) required user testing in System Integration Laboratories (SILs) and hardware/simulation in-the-loop facilities. These battlefield simulators represent adversary systems (e.g. missile systems, command, control and communication systems, electronic warfare systems, etc.) in order to portray a realistic threat environment during testing of U.S. weapon systems.													
Army Threat Simulator and Threat Simulation products developed or fielded under this Project support Army-wide, non-system-specific threat product requirements. Each capability is pursued in concert and coordination with existing Army/DoD and Tri-Service capabilities to eliminate duplication of effort. Simulator development is responsive to Office of the Secretary of Defense and Government Accountability Office guidance for the Army to conduct operational testing in a realistic threat environment. Actual threat equipment is acquired when appropriate (in lieu of development) and total package fielding is still required (i.e., instrumentation, operations and maintenance, manuals, new equipment training, etc.) Threat simulator development is accomplished under the auspices of the Project Manager for Cyber Test and Training (PM CT2) formerly Instrumentation, Targets and Threat Simulators (PM ITTS) and the Director, Operational Test and Evaluation (DOT&E) Threat Simulator Investment Working Group.													
B. Accomplishments/Planned Programs (\$ in Millions)											FY 2019	FY 2020	FY 2021
Title: Network Exploitation Test Tool (NETT).											1.450	1.849	-
Description: NETT is a comprehensive Threat Cyberspace Operations (TCO) tool designed for Test and Evaluation (T&E) to portray evolving hostile and malicious Threat effects within the Cyber domain. Program will continue to provide an integrated suite of open-source/open-method exploitation tools to be integrated with robust reporting and instrumentation capabilities. NETT is used by TCO teams to replicate the tactics of state and non-state Threats and is supported by a robust TCO development environment. The Cyber domain is the most rapidly changing domain in which our systems operate. NETT program will continue research of these capabilities and will use an in-depth process to clean, fix, sustain, modernize, and integrate required Threat tools, tactics, and techniques that will be needed during T&E. Focus areas include: continued Threat integration, instrumentation, distributed collaboration between multiple users, targets and attack visualization, data collection and remote agent development.													
FY 2020 Plans:													

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 6	PE 0604256A / Threat Simulator Development	976 / Army Threat Sim (ATS)	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020
Continue EMD phase for the NETT including the integration of new tools, tactics, and techniques into NETT in order to portray the evolving threat environment.			
FY 2020 to FY 2021 Increase/Decrease Statement: NETT will become part of Threat Information Warfare beginning FY2021.			
Title: Threat Systems Management Office's (TSMO) Threat Operations		1.256	1.429
Description: The Threat Operations program will fund the operation, maintenance, management, and sustainment capability for Threat systems used to portray a realistic threat environment during Army testing and training within the Army's Threat inventory in order to support multiple Army/DoD test events including Network Integration Evaluation / Army Warfighting Assessment (NIE / AWA) and anticipated excursion test events for numerous Systems Under Test / Programs of Record (SUT / POR).			-
FY 2020 Plans: Will continue to support multiple Army test events including NIE / AWA and anticipated excursion test events for numerous SUT / POR currently identified through FY2020.			
FY 2020 to FY 2021 Increase/Decrease Statement: Threat Operations will become part of Threat Electronic Warfare beginning FY2021.			
Title: Threat Cyberspace Operations (TCO), formerly named Threat Computer Network Operations Team (TCNOT)		0.565	2.444
Description: TCO supports Army/DoD events by maintaining a team of highly qualified, trained, and certified TCO professionals who execute Cyber operations against systems under test. The TCO program was designated a "Threat CNO Team" under Army Regulation (AR) 380-53 and is accredited as a United States Cyber Command (USCYBERCOM) / National Security Agency (NSA) certified "Red Team".			-
FY 2020 Plans: TCO funding provides for Contractor subject matter expertise within the Cyber Red Team workforce to support critical threat assessments.			
FY 2020 to FY 2021 Increase/Decrease Statement: Threat Cyberspace Operations (TCO) will become part of Threat Information Warfare beginning FY2021.			
Title: Threat Cyberspace Operations Fidelity Enhancements. formerly named Threat Computer Network Operations (CNO) Fidelity Enhancements		0.762	0.778
Description: Establishes high-fidelity Threat malware and real-world tools, tactics, techniques, and procedures of Threat employment of TCO using commercial Information Technologies (IT) intended to engage complex U.S. operations. Threat			-

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604256A / Threat Simulator Development	Project (Number/Name) 976 / Army Threat Sim (ATS)		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
<p>packages range from "technological nomads" operating autonomously to state level forces using both active and passive network attack to selectively degrade or disrupt C4ISR and Enterprise Business Systems.</p> <p>FY 2020 Plans: The TCO-FI program will continue the validation of high-fidelity threat malware and real-world tools, tactics, techniques, and procedures of threat TCO employment using commercial IT technologies intended to engage complex U.S. operations. Will continue to develop state and non-state threat targeting packages that are current, accurately profiling attack trends and timelines, intent, levels of sophistication, and threat training. These threat packages represent state and non-state level forces using both active and passive network attack to selectively degrade or disrupt C4ISR and Enterprise Business Systems.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: (TCO) Fidelity Enhancements will become part of Threat Information Warfare effort beginning FY2021.</p>				
<p>Title: Advanced Jammer Suite (AJS)</p> <p>Description: The Advanced Jammer Suite expanded the Army's open air and alternatives for Electronic Attack (EA) in a test environment by using variations of jamming to include direct jamming, open air jamming and GPS jamming. It kept the current jamming Threat as an asset to the Army for use in testing at lower test costs while expanding the Army alternative EA in a test environment by using appropriate jamming techniques for the applied testing environment. This program provided Threat representation for the Army/DoD in the jamming domain, developing new and future jamming threats, to include satellite jamming.</p>				1.979 - -
<p>Title: Threat Battle Command Force (TBCF), formerly named Integrated Threat Force (ITF)</p> <p>Description: The Threat Battle Command Force (TBCF) incorporates remote operations via distributed Command and Control (C2) while maintaining valid Threat TTP during Test & Evaluation (T&E) and training events.</p> <p>FY 2020 Plans: Integrate Advanced Electronic Support Sensor Suite (AESSS) initial capabilities and additional threat systems as identified by threat assessments. Increase on the move command and control capabilities to provide threat representative on the move capabilities to the threat operations commander.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Threat Battle Command Force (TBCF) will become part of Threat Network and Mission Command beginning FY2021.</p>				2.270 2.977 -
<p>Title: Next Generation Mobile Communication Network Infrastructure Test Range (Next GEN MCNITR)</p> <p>Description: Next Generation MCNITR provides a mobile, scalable closed-loop cellular communications network infrastructure implementing multiple technologies capable of providing a realistic commercial Radio Frequency (RF) signals environment</p>				1.166 2.003 -

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 6	PE 0604256A / Threat Simulator Development	976 / Army Threat Sim (ATS)	
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
needed for testing and training of U.S. forces in urban and suburban battle space environments. The Next Generation MCNITR program acquires a capability that simulates real-world RF signals environment and that supports representative Threat force reliance of network enabled devices dependent on advanced cellular technology.			
FY 2020 Plans: Continue development of 4GLTE IOC through Full Operational Capability (FOC). FOC will create threat representative commercial cellular environments.			
FY 2020 to FY 2021 Increase/Decrease Statement: (Next GEN MCNITR) will become part of Threat Network and Mission Command effort beginning FY2021.			
Title: Advanced Electronic Support Sensor Suite (AESSS) Description: AESSS provides expansion of Army's ability to portray acoustic, seismic, radio frequency, and electro-optical / infrared (EO/IR) sensor capabilities.	1.859	2.637	-
FY 2020 Plans: Develop threat representative unmanned sensor mesh network leveraging lessons learned on prior programs.			
FY 2020 to FY 2021 Increase/Decrease Statement: (AESSS) will become part of Threat Electronic Warfare effort beginning FY2021.			
Title: Management and oversight of Cyber Blue Team vulnerability assessments Description: In 2016 the Army Acquisition Executive (AAE) designated PM ITTS as the Office of Primary Responsibility for Acquisition Blue Teams, to provide management and execution of relevant Cyber Blue Team assessment capabilities in support of the acquisition and test communities. Cyber Blue Teams refer to the cyber team which works cooperatively with the system owner to ensure programs can defend against attackers and/or Red Teams. These Cyber Blue Team capabilities are essential to enable military operators to assess and defeat the presence of cyber security threats across Army networks. PM ITTS will also serve as the primary point of contact for cyber-related testing and vulnerabilities assessments with U.S. Cyber Command and Army Cyber. This Project executes the establishment and management of certification standards for Acquisition Blue Teams and coordination of Blue Team requirements on behalf of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology (ASA ALT).	0.925	-	-
Title: Threat Information Warfare Description: Provides cyber red team personnel and Information Operations (IO) weapons, Command and Control (C2), infrastructure, and research for advanced threat capabilities targeting Army programs, systems, and commands. Provides funds	-	-	5.334

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604256A / Threat Simulator Development	Project (Number/Name) 976 / Army Threat Sim (ATS)			
B. Accomplishments/Planned Programs (\$ in Millions) for cyber training and certifications of on-net interactive operators, certified ethical hackers, mission leads, planners and logistics. Access to real-time Internet flow information used for characterization of near-peer threats and the application of this information to Army targets.			FY 2019	FY 2020	FY 2021
FY 2021 Plans: Identify mission sets with focus on the integration of Red Team operator capabilities into the Threat Environments mission set, i.e. provide not only integration of red assets but also include threat defense, threat blue teams, and general threat-based Cyber Network Defender (CND) operations. Operationalize (NETT) infrastructure and capabilities into a distributed cloud-based model such that other DoD Red Teams (joint teams) and Army teams can leverage the capability from geographically separated locations (fully distributed operations). Will develop state and non-state threat targeting packages that are current, accurately profiling attack trends and timelines, intent, levels of sophistication, and threat training. These threat packages represent state and non-state level forces using both active and passive network attack to selectively degrade or disrupt C4ISR and Enterprise Business Systems. Development of threat targets and networks as new real-world target sets and capabilities evolve.					
FY 2020 to FY 2021 Increase/Decrease Statement: Increased capability to meet evolving Army requirements with integration of (TCO), (NETT), and (TCO) Fidelity Enhancements					
Title: Threat Electronic Warfare Description: Develops Army threat Electronic Warfare capabilities that will simulate a realistic anti-access/aerial denial (A2/AD) environment that will portray critical threats to U.S. DoD satellite communication (SATCOM), navigation, and command, control, and communication (C3I) networks. Develops specific EW capabilities to include cyber/EW convergence, tailored jamming in a complex radio frequency (RF) environment, data spoofing, detection of Low Probability Intercept (LPI) waveforms, artificial intelligence (AI), network modeling, passive detection systems, and advanced electronic support systems. The Threat Operations program will fund the operation, maintenance, management, and sustainment capability for Threat systems used to portray a realistic threat environment during Army testing and training within the Army's Threat inventory in order to support multiple Army/Department of Defense (DoD) test events including Joint Warfighting Assessment (JWA) and anticipated excursion test events for numerous Systems Under Test / Programs of Record (SUT / POR).			-	-	4.177
FY 2021 Plans: Continue to develop and integrate electronic support sensors and electronic attack payloads to provide a robust and threat representative capability to support testing of Army systems. Threat Position, Navigation, and Timing (PNT) Jammer will consist of modifications and upgrades to ensure relevance by implementing additional capabilities within the PNT spectrum. Threat					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604256A / Threat Simulator Development	Project (Number/Name) 976 / Army Threat Sim (ATS)			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019	FY 2020	FY 2021
Operations will continue to support multiple Army test events including Joint Warfighting Assessment (JWA) and anticipated excursion test events for numerous Systems Under Test/ Programs of Record (SUT / POR) currently identified through FY2021.					
FY 2020 to FY 2021 Increase/Decrease Statement: Increase to Army requirements and addition of Electronic Support and Electronic Attack nodes and platforms.	Title: Threat Network and Mission Command Description: Develops Army threat Network and Mission Command capabilities to include quantum computing techniques, use of adaptive RF transmissions, self-healing/mesh network, capabilities aimed at masking threat communication systems (Very High Frequency (VHF), Ultra High Frequency (UHF), and High Frequency (HF), satellite and cellular, and next generation tactical radios. FY 2021 Plans: Continue system integration and improve the network fidelity, as well as develop data fusion and artificial intelligence to provide improved decision aids to the Threat Force Commander.		-	-	5.004
FY 2020 to FY 2021 Increase/Decrease Statement: Increased capability with integration of additional systems into the network.					
Accomplishments/Planned Programs Subtotals				12.232	14.117
FY 2019	FY 2020				
Congressional Add: Integrated Threat Force Cyber Threat Simulators	6.000	-			
FY 2019 Accomplishments: Integrated Threat Force Cyber Threat Simulators					
Congressional Add: Threat Cyberspace Operations	10.000	13.000			
FY 2019 Accomplishments: Threat Cyberspace Operations					
FY 2020 Plans: Threat Cyberspace Operations					
Congressional Add: Cyber Security Operations Center	18.500	15.000			
FY 2019 Accomplishments: Cyber Security Operations Center					
FY 2020 Plans: Cyber Security Operations Center					
Congressional Adds Subtotals				34.500	28.000

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army	Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604256A / Threat Simulator Development	Project (Number/Name) 976 / Army Threat Sim (ATS)
C. Other Program Funding Summary (\$ in Millions)		
N/A		
Remarks		
D. Acquisition Strategy		
N/A		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020				
Appropriation/Budget Activity					R-1 Program Element (Number/Name)										
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0604258A / Target Systems Development										
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost			
Total Program Element	-	31.286	28.327	10.668	-	10.668	11.452	12.992	11.196	10.774	Continuing	Continuing			
238: Aerial Targets	-	29.240	26.506	7.546	-	7.546	7.955	9.829	8.199	8.199	Continuing	Continuing			
459: Ground Targets	-	2.046	1.821	3.122	-	3.122	3.497	3.163	2.997	2.575	Continuing	Continuing			
A. Mission Description and Budget Item Justification															
This Program Element funds aerial and ground target hardware and software development, maintenance, and upgrades. The overall objective is to ensure validation of weapon system accuracy and reliability by developing aerial and ground targets essential for test and evaluation (T&E). These targets are economical and expendable, remotely controlled or stationary, and often destroyed in use. The Army is the Tri-Service lead under the Secretariat Reliance panel for providing rotary wing, mobile ground, towed, and designated targets for T&E. The Army executes development of some service-peculiar target requirements in support of quality assurance, lot acceptance, and training and continues development of service-peculiar and on-going target materiel upgrades to maintain continuity with current weapons technology and trends in modern and evolving Army weapons.															
B. Program Change Summary (\$ in Millions)					FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total						
Previous President's Budget					32.120	8.327	9.080	-	9.080						
Current President's Budget					31.286	28.327	10.668	-	10.668						
Total Adjustments					-0.834	20.000	1.588	-	1.588						
<ul style="list-style-type: none"> • Congressional General Reductions • Congressional Directed Reductions • Congressional Rescissions • Congressional Adds • Congressional Directed Transfers • Reprogrammings • SBIR/STTR Transfer • Adjustments to Budget Years 					-	-	-	-	-						
					-	20.000	-	-	-						
					-0.834	-	-	-	-						
					-	-	1.588	-	1.588						
Congressional Add Details (\$ in Millions, and Includes General Reductions)															
Project: 238: Aerial Targets															
Congressional Add: Cyber Virtualization Center															
Congressional Add: UAS Swarm Threat and Mitigation															
Congressional Add Subtotals for Project: 238															
Congressional Add Totals for all Projects															
							FY 2019	FY 2020							
							20.000	-							
							-	20.000							
							20.000	20.000							
							20.000	20.000							

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0604258A / Target Systems Development					Project (Number/Name) 238 / Aerial Targets			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
238: Aerial Targets	-	29.240	26.506	7.546	-	7.546	7.955	9.829	8.199	8.199	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			

A. Mission Description and Budget Item Justification

The Aerial Targets Project supports Army readiness through development, acquisition, operation and modernization of aerial targets. Multi-spectral Aerial Targets include realistic surrogates, actual high performance threat aircraft, and virtual target computer models. Current and emerging weapons systems require test, evaluation, and training using threat representative aerial targets to assess weapons systems effectiveness in the operational environment. This project encompasses a portfolio of full-scale, miniature, and subscale fixed wing/rotary wing targets, virtual targets, ancillary devices, and associated control systems. For accurate threat portrayal that properly stresses weapons systems during test and evaluation, aerial targets must exhibit the flight characteristics, threat signatures, and other performance factors to represent or emulate relevant and validated threats. This Project funds: the long-range planning necessary to determine future target needs and development of coordinated requirements; the management of target research, development, test and evaluation, production, and modernization; execution of the validation process to ensure that aerial targets accurately represent the threat; as well as storage and repair parts. The Army is the Test Enterprise Reliance lead for Rotary Wing Targets and Towed Target development and the Tri-Service lead for procurement and enhancement of the MQM-107 fixed wing High Speed Aerial Target.

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

	FY 2019	FY 2020	FY 2021
Title: Towed Targets/Ancillary devices.	0.469	0.266	0.377
Description: Engineering & Manufacturing Development (EMD) phase activities for Towed Targets/Ancillary devices.			

FY 2020 Plans:
 Continues EMD for Towed Targets/Ancillary devices, to include development, enhancement, maintenance, and sustainment for towed targets and ancillary devices as needed. Continued development and testing of Low Cost Towed target systems (Sphere Tow and the Glide Tow Target) emulating current threats at a very low cost to Lower Tier Project Office (LTPO), Indirect Fires Protection Capability (IFPC), United States Army Center for Countermeasures/Office of the Secretary of Defense (CCM/OSD), and classified customers. Signature modification and performance enhancement efforts for these targets is ongoing. Investigates and tests other cost-saving towed systems (Glide-Tow, Cruise Missile Tow Target, Towed Spheres, and Tow Test Bed) for Air Defense Weapons System customers.

FY 2021 Plans:
 Continues EMD for Towed Targets/Ancillary devices, to include development, enhancement, maintenance, and sustainment for towed targets and ancillary devices as needed. Continued development and testing of Low Cost Towed target systems (Sphere Tow and the Glide Tow Target) emulating current threats at a very low cost to (LTPO), (IFPC), (CCM/OSD), and classified customers. Signature modification and performance enhancement efforts for these targets is ongoing. Investigates and tests other

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604258A / Target Systems Development	Project (Number/Name) 238 / Aerial Targets		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
cost-saving towed systems (Glide-Tow, Cruise Missile Tow Target, Towed Spheres, and Tow Test Bed) for Air Defense Weapons System customers.				
FY 2020 to FY 2021 Increase/Decrease Statement: Increase aligns program requirements to Army Modernization priorities in support of the National Defense Strategy.				
Title: Aerial Virtual Targets.		0.784	0.462	0.603
Description: EMD phase activities for Aerial Virtual Targets.				
FY 2020 Plans: Will continue engineering and manufacturing for Aerial Virtual Targets for evolving Army and Department of Defense simulation standards and evolving implementation techniques; focuses on simulation target models of airplanes, helicopters, missiles, unmanned aerial vehicles, and aerial targets in commonly used formats to support visualization, infrared analysis, and radar analysis simulations; will support verification and validation of models, will provide archiving and distribution of simulation target models to simulation developers throughout the Army and DoD T&E communities. Simulation target models are employed to facilitate simulations for Developmental Test (DT) and Operational Test (OT) planning, test rehearsal, post-test analysis, hardware-in-the-loop testing, and execution of test events that are too costly or difficult to be conducted under actual field conditions. These models will be used by multiple DoD agencies and multiple weapon systems such as, but not limited to Close Combat Weapon System, Unmanned Aerial Systems, and Lower Tier Program offices.				
FY 2021 Plans: Will continue engineering and manufacturing for Aerial Virtual Targets for evolving Army and DoD simulation standards and evolving implementation techniques; focuses on simulation target models of airplanes, helicopters, missiles, unmanned aerial vehicles, and aerial targets in commonly used formats to support visualization, infrared analysis, and radar analysis simulations; will support verification and validation of models, will provide archiving and distribution of simulation target models to simulation developers throughout the Army and DoD T&E communities. Simulation target models are employed to facilitate simulations for (DT) and (OT) planning, test rehearsal, post-test analysis, hardware-in-the-loop testing, and execution of test events that are too costly or difficult to be conducted under actual field conditions. These models will be used by multiple DoD agencies and multiple weapon systems such as, but not limited to Close Combat Weapon Systems, Unmanned Aerial Systems, and Lower Tier Program offices.				
FY 2020 to FY 2021 Increase/Decrease Statement: Increase aligns program requirements to Army Modernization priorities in support of the National Defense Strategy.				
Title: Army Ground Aerial Target Control System (AGATCS).		3.275	2.348	2.793

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604258A / Target Systems Development	Project (Number/Name) 238 / Aerial Targets			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019	FY 2020	FY 2021
Description: EMD phase activities for the AGATCS in support of a modern current technology target control system for control of subscale and full scale aerial, surface (ground/seaborne), Small Unmanned Aerial System (SUAS) and rotary wing targets.					
FY 2020 Plans: AGATCS engineering and manufacturing to provide remote control of aerial (fixed wing, rotary wing, and simulated unmanned aerial systems (SUAS)), ground (heavy, medium, and light vehicles), and seaborne targets with a single control system in support of live fire testing necessary for lethality evaluation and sensor package testing for evaluation of suitability and effectiveness. Complies with DODI 8510.01 mandate / DOD Risk Management Framework on all target control systems to ensure a secure operating posture. Meets surface target testing requirements to include formation, collision avoidance, and swarming capabilities for United States Army test ranges. Provides Test Centers and the T&E community with a versatile seaborne and rotary wing resource for use in conducting tests to include live fire testing, observation, signal repeater and cargo transportation.					
FY 2021 Plans: AGATCS engineering and manufacturing to provide remote control of aerial (fixed wing, rotary wing, and simulated unmanned aerial systems (SUAS)), ground (heavy, medium, and light vehicles), and seaborne targets with a single control system in support of live fire testing necessary for lethality evaluation and sensor package testing for evaluation of suitability and effectiveness. Complies with DODI 8510.01 mandate / DOD Risk Management Framework on all target control systems to ensure a secure operating posture. Meets surface target testing requirements to include formation, collision avoidance, and swarming capabilities for U.S. Army test ranges. Provides Test Centers and the T&E community with a versatile seaborne and rotary wing resource for use in conducting tests to include live fire testing, observation, signal repeater and cargo transportation.					
FY 2020 to FY 2021 Increase/Decrease Statement: Increase aligns program requirements to Army Modernization priorities in support of the National Defense Strategy.					
Title: Unmanned Aerial System - Target (UAS-T). Description: Technical updates and life cycle management activities for the UAS-T to provide Threat representative support for test and experimentation missions.			0.374	0.201	1.056
FY 2020 Plans: Technical and life cycle management for the UAS-T to operate and maintain a generic, tactical class unmanned aircraft system target to support a variety of test requirements by providing a generic threat representative aerial target to support test and experimentation missions. Projects to be supported include the Space and Missile Defense Command and the Joint Integration Air and Missile Defense Organization live fire testing. This activity will continue to require technical support for investigation,					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020					
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604258A / Target Systems Development	Project (Number/Name) 238 / Aerial Targets						
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019	FY 2020	FY 2021			
demonstration, and integration of a more economical target, to include technical oversight of the targets' acquisition and ground support equipment.								
FY 2021 Plans: Technical and life cycle management for the UAS-T to operate and maintain a generic, tactical class unmanned aircraft system target to support a variety of test requirements by providing a generic threat representative aerial target to support test and experimentation missions. Projects to be supported include the Space and Missile Defense Command and the Joint Integration Air and Missile Defense Organization live fire testing. This activity will continue to require technical support for investigation, demonstration, and integration of a more economical target, to include technical oversight of the targets' acquisition and ground support equipment.								
FY 2020 to FY 2021 Increase/Decrease Statement: Increase aligns program requirements to Army Modernization priorities in support of the National Defense Strategy.								
Title: High Speed Aerial Target (HSAT). Description: Funds the EMD phase for the replacement of the aging MQM-107 with the new BQM-167A to provide a realistic aerial target capable of simulating the performance of enemy aircraft; technical and life cycle management activities for equipment, to include engineering change proposals, technology obsolescence, and safety and system data documentation for the HSAT Target. Program requires technical support for investigation, demonstration, and integration of a more economical target. Technical oversight of the replacement targets' acquisition along with Ground Support Equipment (GSE) and other activities related to getting it operational is essential; provides a realistic aerial target capable of simulating the performance of enemy aircraft to aid in the research, development, test, and evaluation of weapons systems and aid in training operational units employing production missile systems.					4.338	2.934	2.717	
FY 2020 Plans: Funds the technical sustainment of all HSATs. This funding covers the engineering, integration, safety, cyber security, technology obsolescence, safety and system data documentation, Air Worthiness Release development, and flight waivers for the entire enterprise, as well as, non-recurring engineering for software/firmware updates, and minor product upgrades. This includes the MQM-107, MQM-178, BQM-34, and the new BQM-167. These HSATs will continue to support T&E programs such as Patriot, Stinger, Integrated Air and Missile Defense, Sentinel Radar, Cruise Missile Defense System, and classified programs for Army and Tri-Service customers.								
FY 2021 Plans: The U.S Army Targets Management Office provides Aerial Targets to customers for threat realism required by law in Title 10 U.S.C., Section 2366 (Live Fire Test & Evaluation) for the testing of ACAT I/II major munitions, missile programs, or product improvements of these programs. This line is the technical sustainment of all HSATs. This funding covers the engineering,								

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604258A / Target Systems Development	Project (Number/Name) 238 / Aerial Targets	
B. Accomplishments/Planned Programs (\$ in Millions)			
integration, safety, cyber security, technology obsolescence, safety and system data documentation, Air Worthiness Release development, and flight waivers for the entire enterprise, as well as, non-recurring engineering for software/firmware updates, and minor product upgrades. This includes the MQM-107, MQM-178, BQM-34, and the new BQM-167. These HSATs will continue to support T&E programs such as Patriot, Stinger, Integrated Air and Missile Defense, Sentinel Radar, Cruise Missile Defense System, and classified programs for Army and Tri-Service customers.		FY 2019	FY 2020
FY 2020 to FY 2021 Increase/Decrease Statement: Decrease aligns program requirements to Army Modernization priorities in support of the National Defense Strategy.			FY 2021
Title: FY 2020 SBIR/STTR Transfer		-	0.295
Description: Funding transferred in accordance with Title 15 USC ?638			-
FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals			9.240
Congressional Adds Subtotals			6.506
FY 2019			FY 2020
Congressional Add: Cyber Virtualization Center	20.000	-	
FY 2019 Accomplishments: Cyber Virtualization Center			
Congressional Add: UAS Swarm Threat and Mitigation	-	20.000	
FY 2020 Plans: UAS Swarm Threat and Mitigation			
Congressional Adds Subtotals			20.000
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0604258A / Target Systems Development				Project (Number/Name) 459 / Ground Targets				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
459: <i>Ground Targets</i>	-	2.046	1.821	3.122	-	3.122	3.497	3.163	2.997	2.575	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-	
A. Mission Description and Budget Item Justification													
This Project funds Army efforts to support test and evaluation (T&E) of advanced weapon systems and supports Army Modernization and Tri-Service readiness by developing ground target surrogates, acquiring foreign equipment, and developing virtual target computer models of ground vehicle targets. These products are required to adequately stress weapon systems undergoing (T&E). The United States Army is the Tri-Service lead for providing mobile ground targets for (T&E). This tasking includes long-range planning to determine future target needs and development of coordinated requirement documents; the centralized management of the ground target research, development, test and evaluation processes; execution of the validation process; acquisition of foreign equipment; and continuing maintenance, storage, and development/enhancement/update via engineering services of developed and acquired targets to ensure availability for (T&E) customers. This Project also manages use of current assets and operates a centralized spare parts program.													
B. Accomplishments/Planned Programs (\$ in Millions)											FY 2019	FY 2020	FY 2021
Title: Mobile Ground Target Operations (MGTO)											1.152	1.002	1.560
Description: MGTO provides oversight of five Primary Operating Centers to include operation, storage, maintenance, repair, safety and configuration management. The objective of the MGTO effort is to support the testing community as fully, efficiently and effectively as possible. The MGTO centrally manages a fleet of foreign threat ground vehicles while maintaining the foreign integrity of the assets.													
FY 2020 Plans: Will maintain a fleet of reusable ground targets emulating relevant, current, and emerging threats which provides cost effective solutions for T&E. The MGTO will provide support and oversight for actual threat foreign ground vehicles and mobile ground target surrogate vehicles for use as threat targets by the T&E community for destructive and non-destructive scenarios. Efforts will support users such as, but not limited to Apache 64E, Joint Air to Ground Missile, Javelin, Extended Range Guided Multiple Launch Rocket System, Army Tactical Missile System, Cruise Missile Defense System, Precision Fires, Counter Rocket Artillery and Missile (C-RAM), Close Combat Weapon System, and other research, prototyping, and operational users.													
FY 2021 Plans: Will maintain a fleet of reusable ground targets emulating relevant, current, and emerging threats which provides cost effective solutions for T&E. The (MGTO) will centrally manage a fleet of foreign threat ground vehicles while maintaining the foreign integrity of the assets. The MGTO will provide support and oversight for actual threat foreign ground vehicles and mobile ground target surrogate vehicles for use as threat targets by the T&E community for destructive and non-destructive scenarios. Efforts will support users such as, but not limited to Apache 64E, Joint Air to Ground Missile, Javelin, Extended Range Guided Multiple													

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604258A / Target Systems Development	Project (Number/Name) 459 / Ground Targets			
B. Accomplishments/Planned Programs (\$ in Millions) Launch Rocket System, Army Tactical Missile System, Cruise Missile Defense System, Precision Fires, Counter Rocket Artillery and Missile, Close Combat Weapon System, and other research, prototyping, and operational users. FY 2020 to FY 2021 Increase/Decrease Statement: Increase aligns program requirements to Army Modernization priorities in support of the National Defense Strategy.			FY 2019	FY 2020	FY 2021
Title: Mobile Ground Targets Hardware (MGTH)			0.459	0.370	0.737
Description: MGTH provides a mix of actual threat assets and surrogate targets to support Army T&E events.					
FY 2020 Plans: Will provide cost effective and highly threat representative surface targets (consisting of actual foreign equipment as well as surrogates) for T&E of multiple Weapon System developers. Will continue to provide surface targets to meet the functionality and signature fidelity requirements of the objective force. Will acquire actual foreign equipment, to include insurgent vehicles, to meet known Weapon System target shortfalls. Will continue to initiate analysis and design efforts to address specific capability shortfalls and the ability to develop threat representative surrogates.					
FY 2021 Plans: Will provide cost effective and highly threat representative surface targets (consisting of actual foreign equipment as well as surrogates) for T&E of multiple Weapon System developers. Will continue to provide surface targets to meet the functionality and signature fidelity requirements of the objective force. Will acquire actual foreign equipment, to include insurgent vehicles, to meet known Weapon System target shortfalls. Will continue to initiate analysis and design efforts to address specific capability shortfalls and the ability to develop threat representative surrogates.					
FY 2020 to FY 2021 Increase/Decrease Statement: Increase aligns program requirements to Army Modernization priorities in support of the National Defense Strategy.					
Title: Ground Virtual Targets			0.435	0.366	0.825
Description: Government System (T&E) to support the research and development of Ground Virtual Targets. Virtual Targets are employed by multiple Department of Defense agencies and weapon systems to facilitate simulations for Developmental and Operational Test planning, rehearsal, post-test analysis, hardware-in-the-loop testing, and execution of test events that are too costly or difficult to be conducted under actual field conditions.					
FY 2020 Plans: Will continue engineering and manufacturing for Ground Virtual Targets for evolving Army and DoD simulation standards and evolving implementation techniques. Will focus on simulation target models of armored assets, air defense systems, small - unmanned aerial systems vehicles, maritime systems and other surface targets in commonly used formats to support					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604258A / Target Systems Development	Project (Number/Name) 459 / Ground Targets	
B. Accomplishments/Planned Programs (\$ in Millions)			
visualization, infrared analysis, and radar analysis simulations. Will support verification and validation of models and provide archiving and distribution of simulation target models to simulation developers throughout the Army and DoD T&E communities.		FY 2019	FY 2020
FY 2021 Plans: Will continue engineering and manufacturing for Ground Virtual Targets for evolving Army and DoD simulation standards and evolving implementation techniques. Will focus on simulation target models of armored assets, air defense systems, small - unmanned aerial systems vehicles, maritime systems and other surface targets in commonly used formats to support visualization, infrared analysis, and radar analysis simulations. Will support verification and validation of models and provide archiving and distribution of simulation target models to simulation developers throughout the Army and DoD T&E communities.			FY 2021
FY 2020 to FY 2021 Increase/Decrease Statement: Increase aligns program requirements to Army Modernization priorities in support of the National Defense Strategy.			
Title: FY 2020 SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC ?638		-	0.083
FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638 FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals			2.046 1.821 3.122
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0604759A / Major T&E Investment							
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	79.214	146.565	106.270	-	106.270	59.144	73.193	67.302	74.317	Continuing	Continuing
983: Reagan Test Site (RTS) T&E Investments	-	7.035	6.247	6.280	-	6.280	6.567	6.688	8.143	8.143	Continuing	Continuing
984: Major Developmental Testing Instrumentation	-	21.092	44.342	44.614	-	44.614	38.511	42.864	32.500	31.950	Continuing	Continuing
986: Major Operational Test Instrumentation	-	15.150	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
EY9: Range Radar Replacement Program (RRRP)	-	22.272	94.760	54.322	-	54.322	12.968	21.380	25.545	33.110	Continuing	Continuing
FA4: Warrior Injury Assessment Manikin (WIAMan)	-	13.665	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
FF1: Cyber Blue Team	-	0.000	1.216	1.054	-	1.054	1.098	2.261	1.114	1.114	0.000	7.857

A. Mission Description and Budget Item Justification

This Program Element (PE) funds the development and acquisition of major developmental test instrumentation for the United States (U.S.) Army Test and Evaluation Command's (ATEC) test activities: White Sands Test Center (WSTC), New Mexico; Yuma Test Center (YTC), Arizona; Aberdeen Test Center (ATC), Maryland; Electronic Proving Ground (EPG), Arizona; Redstone Test Center (RTC), Alabama; and for the Reagan Test Site (RTS) at the United States Army Kwajalein Atoll (USAKA), which is managed by the Space and Missile Defense Command. This PE also funds development and acquisition of Operational Test Command's (OTC) major field instrumentation and beginning in Fiscal Year 2020 (FY20), management of the Cyber Acquisition Blue Teams (CABT) certification standards. Requirements for instrumentation and cyber certifications are identified through a long range survey of project managers, Research Development and Engineering Centers (RDECs), and Battle Laboratories developing future weapon systems and the test programs that support these systems. Army testing facilities are also surveyed to determine major testing capability shortfalls.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army					Date: February 2020
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support		PE 0604759A / Major T&E Investment			
B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	82.893	136.565	77.953	-	77.953
Current President's Budget	79.214	146.565	106.270	-	106.270
Total Adjustments	-3.679	10.000	28.317	-	28.317
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	10.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.679	-			
• Adjustments to Budget Years	-	-	28.317	-	28.317
Congressional Add Details (\$ in Millions, and Includes General Reductions)	FY 2019	FY 2020			
Project: 984: Major Developmental Testing Instrumentation					
Congressional Add: High Powered Microwave Test and Evaluation Assets					
			Congressional Add Subtotals for Project: 984		
				Congressional Add Totals for all Projects	

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 6					PE 0604759A / Major T&E Investment				983 / Reagan Test Site (RTS) T&E Investments				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
983: <i>Reagan Test Site (RTS) T&E Investments</i>	-	7.035	6.247	6.280	-	6.280	6.567	6.688	8.143	8.143	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			
A. Mission Description and Budget Item Justification													
This Project funds improvement and modernization (I&M) for the Ronald Reagan Ballistic Missile Defense Test Site (RTS) instrumentation systems. The Reagan Test Site with its remote location and one of kind instrumentation systems provides a strategic test environment that cannot be replicated. In order to continue its critical mission of testing missile systems that are of paramount importance to the defense of the nation, the RTS instrumentation systems must be continuously updated and upgraded to support the emerging technologies being developed by the Department of Defense (DOD) such as hypersonics and other advanced weapons systems. Without modernization these instrumentation systems face obsolescence or degraded capability and the inability to provide the critical data needed for continued materiel development. Without instrumentation on par with the technologies being utilized in emerging systems, the materiel developer will be unable to complete their test programs or pass programmatic milestones toward deployment. These funds provide modernization of the radar, telemetry, optics, range safety, communications, command/control and other equipment essential to meet test and evaluation requirements of the Services and DoD agencies. The RTS instrumentation is required to support data collection for test & evaluation assessments and operational decisions that have strategic implications for the Army, Navy, Air Force, United States Strategic Command (STRATCOM), Missile Defense Agency (MDA), Defense Advanced Research Projects Agency (DARPA), National Aeronautics and Space Administration (NASA), and other customers. RTS, located in the Republic of the Marshall Islands, is a remote, secure activity of the Major Range and Test Facility Base (MRTFB). Funding will enable RTS to continue to meet customer objectives and sustain the required instrumentation suite.													
B. Accomplishments/Planned Programs (\$ in Millions)											FY 2019	FY 2020	FY 2021
Title: Radar Reliability Improvement Program (RRI).											0.500	0.741	0.500
Description: The Radar Improvement and Sustainment (RIS) activity is an Improvements and Modernizations (I&M) Umbrella Program to push technology into radar systems. RIS is a group of complimentary I&M Projects that mitigate annual Operations and Maintenance (O&M) risks. Projects initiated address the following needs: Enhancing the Reliability of the Sensor; Technology Refresh; Obsolescence; Commonality of Design across Sensors; Enhanced Monitoring; Fault Detection - Fault Isolation (FD/FI); Enable Remote Operation and Monitoring; and Enhanced Capabilities.													
FY 2020 Plans: RRI Program will continue as an I&M umbrella Program to push technology into the radar systems. RRI projects will address: Enhancing the Reliability of the Sensor; Technology Refresh; Obsolescence; Commonality of Design across Sensors; Enhanced Monitoring FD/FI; Enable Remote Operation and Monitoring; and Enhanced Capabilities.													
FY 2021 Plans:													

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment	Project (Number/Name) 983 / Reagan Test Site (RTS) T&E Investments	
B. Accomplishments/Planned Programs (\$ in Millions)			
RRI Program will continue as an I&M umbrella Program to push technology into the radar systems. RRI projects will address: Enhancing the Reliability of the Sensor; Technology Refresh; Obsolescence; Commonality of Design across Sensors; Enhanced Monitoring FD/FI; Enable Remote Operation and Monitoring; and Enhanced Capabilities.			FY 2019
FY 2020 to FY 2021 Increase/Decrease Statement: Funding change reflects planned lifecycle of this effort.			FY 2020
<p>Title: Telemetry (TM) Modernization Study.</p> <p>Description: This activity will develop the technology required to modernize the telemetry systems using an innovative software defined radio approach designed to vastly improve the ability to adapt to future telemetry changes and requirements quickly with lower cost. In addition, this approach will enable centralized command and control of the telemetry equipment increasing efficiency in mission preparation and execution. The telemetry back-end processing chain is currently comprised of discrete frequency-specific hardware components that are replicated for each telemetry channel required for a test event. This activity will develop a scalable frequency-agnostic, software-based solution that runs on commodity computer servers. More complex missions (e.g., Over-the-air (OTA) operational testing of the Ballistic Missile Defense Systems (BMDS)) will continue to require more telemetry channels, but this activity will avoid much of that future cost. This effort will provide enough hardware to increase capacity of the telemetry system.</p> <p>FY 2020 Plans: Continuation of Verification and Acceptance (V&A) testing effort focusing on engineering test for the full-up capability and deployment of the modernized telemetry equipment to the other TM sites within RTS range (Kwaj, Illegini, & Gagan Islands).</p> <p>FY 2021 Plans: Continuation of V&A testing effort focusing on engineering test for the full-up capability and deployment of the modernized telemetry equipment to the other TM sites within RTS range (Kwaj, Illegini, & Gagan Islands).</p> <p>Title: Legacy Servo Upgrade Program.</p> <p>Description: This activity will design, upgrade, and replace the radar and optics servo systems. The custom-hardware based legacy systems will be replaced with commercially supportable commercial off the shelf (COTS) hardware. Where possible, common components will be used across all range sensors to minimize ongoing maintenance costs.</p> <p>FY 2021 Plans: assessment of remaining antenna servo systems and determine next highest priority servo replacement need and initiate engineering design activities for the next phase of the program.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement:</p>			FY 2021

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment	Project (Number/Name) 983 / Reagan Test Site (RTS) T&E Investments			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019	FY 2020	FY 2021
Decreased due to RTS reprioritization based on criticality of projects.					
Title: Multi-Statics for Radars and Telemetry - Prototype			0.781	-	-
Description: This development will enable all the existing Kiernan Reentry Measurements System (KREMS) radars to be used as illuminators and the RTS telemetry systems to be used as receivers in a multi-static array that will increase the sensitivity of the systems, reduce the need for high power operation in the systems, and in conjunction with the software radio radar project and the solid state transmitter project will allow the radars to be operated at a lower O&M cost.					
Title: Ground Based Discrimination Radar			1.600	-	-
Description: The Ground Based Discrimination Radar activity will provide the RTS with an instrumentation-quality, X-band phased array radar to more robustly support customer mission requirements and provide a relatively cost-effective phased array technology test-bed capability. To control costs, the existing GBR-P, provided by the Missile Defense Agency and initially developed as the prototype fire control radar, will be upgraded.					
Title: RTS Cyber Threat Assessment and Mitigation			0.491	-	0.500
Description: Prototype and integrate a sidelobe canceller (to protect against electronic attack and radar jamming) for ALTAIR Ultra High Frequency (UHF) radar that has compatibility with other KREMs.					
FY 2021 Plans: system development phase with yard antenna placement and integration.					
FY 2020 to FY 2021 Increase/Decrease Statement: Decrease due to RTS reprioritization based on criticality of projects.					
Title: RTS Range Enhancements for Hypersonic Vehicle Testing			-	-	0.309
Description: The Range Enhancements for Hypersonic Vehicle Testing program will develop and deploy advanced technologies and a number of infrastructure upgrades specific to hypersonic vehicle testing. These technologies and infrastructure improvements include advanced non-ballistic tracking enhancements, improved data collection, additional waveform support, sensor surrogate capabilities and integration of adjunct sensors to support situational awareness and future tracking enhancements.					
FY 2021 Plans: begin maturing and deploying enhanced tracking algorithms to the RTS sensor suite					
FY 2020 to FY 2021 Increase/Decrease Statement:					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 6	PE 0604759A / Major T&E Investment	983 / Reagan Test Site (RTS) T&E Investments	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020
Decrease due to RTS reprioritization based on criticality of projects.			
Title: Digital Focal Plane Array (DFPA) Technology Insertion		-	-
Description: DFPA Technology Insertion program designs, builds, and integrates DFPA-based camera systems and other leading-edge imaging technologies into existing Super Recording Automatic Digital Optical Tracker (RADOT) mounts at RTS. The cameras and telescopes will provide coverage in multiple imaging bands including Middle Wave Infra-Red (MWIR) and Long Wave Infra-Red (LWIR).			0.700
FY 2021 Plans: Procure and deploy additional DFPA based cameras at SR Optics site			
FY 2020 to FY 2021 Increase/Decrease Statement: Increase due to RTS reprioritization based on criticality of projects.			
Title: Radar Open System Architecture (ROSA) Refresh		-	2.000
Description: ROSA initial concept and implementation subdivided each of the RTS radars into logical and separable functional building blocks. Up to nine common subsystems including receivers, transmitters and antenna controls were designed using Commercial Off the Shelf (COTS) equipment to provide a unified framework, largely eliminating the very unique and custom hardware and software at each of the RTS radars. Over a decade of technology advancement and further maturity of industry standards have outdated the current ROSA implementation, posing a sustainability problem. This program will identify key subsystem technologies and architectures to stabilize future procurement, maintenance and operational capability across all RTS radars.			-
FY 2020 Plans: replaces COTS that are obsolete, limited in availability or at the end of the life cycle of the equipment with commercially available open architecture components.			
FY 2020 to FY 2021 Increase/Decrease Statement: Requested External funding (CTEIP) for FY21			
Title: TRADEX L-Band High Voltage Power Supply Upgrade		-	0.750
Description: TRADEX L-Band High Voltage Power Supply Upgrade will improve resilience of L-band by providing a backup power supply and a test stand where tubes can be tested without impacting the operational system.			0.820
FY 2020 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 6	PE 0604759A / Major T&E Investment	983 / Reagan Test Site (RTS) T&E Investments	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020
Begin to upgrade the unregulated supply components that are obsolete and a single point of failure for the TRADEX radar with a modern solid state power supply technology			
FY 2021 Plans: Continue to upgrade the unregulated supply components that are obsolete and a single point of failure for the TRADEX radar with a modern solid state power supply technology which would replace the legacy power supply, modulator, crowbar and capacitor bank.			
FY 2020 to FY 2021 Increase/Decrease Statement: Increase due to the criticality of the requirement.			
Title: FFRDC Tax Description: Federally Funded Research and Development Center (FFRDC)		-	0.006
FY 2020 Plans: Federally Funded Research and Development Center (FFRDC)			
FY 2020 to FY 2021 Increase/Decrease Statement: FFRDC Tax			
Title: SBIR/STTR Transfer Description: Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR)		-	0.250
FY 2020 Plans: Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR)			0.251
FY 2021 Plans: Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR)			
FY 2020 to FY 2021 Increase/Decrease Statement: Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR)			
Title: FY2018 NDAA SEC 825 MDAP Cost Overrun Description: FY2018 NDAA SEC 825 MDAP Cost Overrun	0.003	-	-
Accomplishments/Planned Programs Subtotals	7.035	6.247	6.280

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment	Project (Number/Name) 983 / Reagan Test Site (RTS) T&E Investments
C. Other Program Funding Summary (\$ in Millions)		
N/A		
Remarks		
D. Acquisition Strategy		
N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 6					PE 0604759A / Major T&E Investment				984 / Major Developmental Testing Instrumentation				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
984: Major Developmental Testing Instrumentation	-	21.092	44.342	44.614	-	44.614	38.511	42.864	32.500	31.950	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			

A. Mission Description and Budget Item Justification													
This Project develops and acquires major test instrumentation to perform developmental testing of weapon systems at United States Army Test and Evaluation Command's (ATEC) activities which include: Yuma Test Center (YTC), AZ; Aberdeen Test Center (ATC), MD; Electronic Proving Ground (EPG), AZ; White Sands Test Center (WSTC), NM; Redstone Test Center (RTC), AL.													
Projects are designated as a major test program based on their visibility, assessed relative technical risk (medium-high), schedule risk, cost (greater than 1.500 Million per year or 7.500 Million for the total Project) and applicability to other mission areas or services. These Projects are technically demanding, state-of-the-art, unique instrumentation assets or suites to meet the technology shortfalls, and generally result from development programs managed by a professional project management team. Fiscal Year 2021 (FY21) funds will be used for modernization of outdated instrumentation in support of developmental testing for Army, Department of Defense programs.													
Test Network Modernization (TNM) will upgrade existing test data networks to ensure infrastructures are capable of providing reliable and secure transport of data and communications for ATEC test activities. Applied Environments Modernization (AEM) program will upgrade antiquated Environmental labs for climatic and dynamic testing with new cascade refrigeration units, climatic chambers, vibration test systems, x-ray cameras, a real-time radiography system and full spectrum solar lights. Robotics/Unmanned Aerial Systems (R/UAS) Instrumentation Suite will develop and procure instrumentation for testing controlled and autonomous ground and aerial robotic systems. System of Systems Cooperative Engagement Test Infrastructure (SCETI) will provide for the development of systems to conduct systems-level Manned-Unmanned Teaming (MUM-T) testing for both aircraft and ground systems in a distributed environment. ATEC Fiber Modernization will provide all ATEC Test Centers with a revitalized fiber network to complement the TNM program. Telemetry Systems Modernization (TSM) will modernize outdated telemetry systems with new equipment designed to enhance the technical and spectral capabilities currently available. This new telemetry equipment will also provide for a remote controlled operational environment.													
B. Accomplishments/Planned Programs (\$ in Millions)													
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Electromagnetic Environmental Effects (E3) Systems Modernization (EMRE) project.										FY 2019	FY 2020	FY 2021	
Description: EMD phase contract activities for the EMRE project. This effort will upgrade 27 instrumentation test facilities at WSMR. This effort supports Long Range Precision Fires, Next Generation Combat Vehicle and Future Vertical Lift Cross-Functional Teams.										0.114	6.340	-	

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment	Project (Number/Name) 984 / Major Developmental Testing Instrumentation		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
FY 2020 Plans: Will complete acquisition of key components and finish project in FY20. Additional key components include Electromagnetic Interface equipment and Pulsed Ultra Magnetron Discharge equipment needed for electromagnetic instrumentation testing at WSMR.				
FY 2020 to FY 2021 Increase/Decrease Statement: Project completion expected in FY2020.				
Title: EMD phase contract activity for the Nuclear Effects Test Capability Modernization. Description: EMD phase contract activity for the Nuclear Effects Test Capability Modernization. This effort supports Long Range Precision Fires, Next Generation Combat Vehicle and Future Vertical Lift Cross-Functional Teams.		5.246	8.515	-
FY 2020 Plans: Will complete the EMD phase and field the Nuclear Effects Test Capabilities Modernization Prompt Gamma Simulator. FY 2020 to FY 2021 Increase/Decrease Statement: Project completion expected in FY2020.				
Title: EMD phase contract activity of the Test Network Modernization. Description: EMD phase contract activity for the Test Network Modernization. This effort will provide a modern test infrastructure capable of reliable, secure transport of test data and test communications for all ATEC test ranges. This effort supports Long Range Precision Fires, Next Generation Combat Vehicle and Future Vertical Lift Cross-Functional Teams.		9.085	12.621	13.020
FY 2020 Plans: Will continue the engineering and manufacturing for the Test Network Modernization. This program will provide a modern test infrastructure capable of reliable, secure transport of test data and test communications for all ATEC developmental test ranges. Funds continue the procurement and install of end of life network hardware for five Test Centers (Aberdeen, Electronic Proving Grounds, Redstone, White Sands, and Yuma), replacing obsolete hardware that no longer meets Authority to Operate (ATO) requirements. Funds will continue standardization of Network Monitoring System across five Test Centers (Aberdeen, Electronic Proving Grounds, Redstone, White Sands, and Yuma) to allow operators the ability to monitor and track network traffic and troubleshoot network failure points. FY 2021 Plans: The Test Network Modernization effort will continue in the engineering and manufacturing phase. The site surveys from FY19 will have been evaluated and the remainder of the equipment required for the Test Centers will be purchased based on considerations of their requirements and their upcoming tests. In addition, the evaluation of the site surveys will be complete and the direction				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment	Project (Number/Name) 984 / Major Developmental Testing Instrumentation		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
for hardware and software needs will be accomplished so as to provide the direction to create an enterprise network for the test centers. FY21 funds in the amount of 13.020 Million will continue the standardization of the network that will allow modern monitoring, tracking, and troubleshooting of network issues and failure points.				
FY 2020 to FY 2021 Increase/Decrease Statement: FY2021 budget increase due to additional equipment upgrade needs identified in FY2019 test center site surveys.				
Title: EMD for the Applied Environments Modernization. Description: EMD phase contract activity for the Applied Environments Modernization program. This effort supports Long Range Precision Fires, Next Generation Combat Vehicle, Future Vertical Lift, Air and Missile Defense Cross-Functional Teams.		3.785	0.776	10.656
FY 2020 Plans: Will continue the EMD phase for the Applied Environments Modernization program. Funds will continue to provide upgrades to antiquated Environmental labs for climatic and dynamic testing with new cascade refrigeration units, climatic chambers, vibration test systems, x-ray cameras, a real-time radiography system and full spectrum solar lights.				
FY 2021 Plans: Will continue EMD phase for Applied Environments Modernization program. In FY2021 funds in the amount of 10.656 Million will be used to procure various environmental lab upgrades at EPG (Electronic Proving Ground), WSTC (White Sands Test Center), YTC (Yuma Test Center) and ATC (Aberdeen Test Center). A Large Salt-Fog chamber, fungus chamber and humidity chamber will be procured for EPG. A field refrigeration unit and conditioning chamber will be procured for YTC. Temperature conditioning equipment will be provided to ATC. A Large Salt-Fog chamber will be provided to WSTC along with a refurbished large force shaker.				
FY 2020 to FY 2021 Increase/Decrease Statement: Funds in FY2020 were realigned to higher priority projects to support the Army's modernization priorities. In FY2021, the increase in funds will allow for continued environmental lab upgrades needed at ATEC Test Centers.				
Title: EMD phase contract activity for System of Systems Controlled Environment Test Infrastructure (SCETI) Description: EMD phase for System of Systems Cooperative Engagement Test Infrastructure (SCETI). This effort supports the Future Vertical Lift Cross-Functional Team.		2.862	3.052	5.281
FY 2020 Plans: Will continue EMD phase contract activity for the SCETI program. In FY2020, this program will complete Emulation Flight Capability installation and acceptance testing; and the design and acceptance testing of Atmospheric Measurement equipment.				
FY 2021 Plans:				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment	Project (Number/Name) 984 / Major Developmental Testing Instrumentation	
B. Accomplishments/Planned Programs (\$ in Millions)			
Will continue EMD phase for the SCETI Program. In FY2021 funds in the amount of 5.281 Million will be used to provide system integration and completion of the development of the rain degraded visual environment capability. The funds will also be used to develop the fog and snow degraded visual environment capabilities.		FY 2019	FY 2020
FY 2020 to FY 2021 Increase/Decrease Statement: FY2021 increase for equipment needed for development and integration of fog and snow degraded visual environment capabilities.			FY 2021
Title: EMD phase contract activity for Robotics/UAS Instrumentation Suite Description: EMD phase of Robotics/Unmanned Autonomous System (UAS) Instrumentation Suite for testing controlled and autonomous ground and aerial robotic systems. This effort supports Next Generation Combat Vehicle and Future Vertical Lift Cross-Functional Teams.		-	1.479
FY 2020 Plans: Continue market research and acquisition strategy refinement.			6.500
FY 2021 Plans: Funds in the amount of 6.500 Million will complete acquisition strategy and begin acquiring equipment needed for testing controlled and autonomous ground and aerial robotic systems at Aberdeen Test Center.			
FY 2020 to FY 2021 Increase/Decrease Statement: Increase of funds needed to begin procuring necessary equipment identified during acquisition strategy refinement.			
Title: EMD phase contract activity for ATEC Fiber Modernization Description: ATEC Fiber Modernization will provide all ATEC Test Centers with a revitalized fiber network to complement the Test Network Modernization (TNM) program. This effort provides test centers with an improved fiber infrastructure to support greater data payloads and increased network reliability. This enterprise effort will replace fiber optic cable at the test centers to extend the lifecycle of the test networks. This effort supports Long Range Precision Fires, Next Generation Combat Vehicle, Network, Air and Missile Defense and Future Vertical Lift Cross-Functional Teams.		-	1.000
FY 2021 Plans: begin market research and creation of acquisition strategy for replacement of fiber network at all ATEC test centers.		-	
FY 2020 to FY 2021 Increase/Decrease Statement: ATEC Fiber modernization is an FY21 new start effort.			
Title: EMD phase contract activity for Telemetry Systems Modernization		-	8.157

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment	Project (Number/Name) 984 / Major Developmental Testing Instrumentation	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019 FY 2020 FY 2021
<p>Description: Telemetry Systems Modernization will modernize current outdated telemetry systems located at: White Sands Test Center, Yuma Test Center, Aberdeen Test Center and Redstone Test Center. The modernization of these systems will provide enhanced technical and spectral capability while also providing for a remote controlled operational environment. This effort supports Long Range Precision Fires, Next Generation Combat Vehicle, Air and Missile Defense, and Future Vertical Lift Cross-Functional Teams.</p> <p>FY 2021 Plans: will complete acquisition strategy and begin replacing obsolete Telemetry system components at Redstone Test Center, Yuma Test Center and White Sands Test Center. This replacement will include Commercial-Off-The-Shelf (COTS) fixed site and mobile telemetry equipment.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Telemetry Systems Modernization is an FY21 new start effort which initiate replacement of COTS telemetry equipment.</p>			
<p>Title: FY 2020 SBIR/STTR Transfer</p> <p>Description: Funding transferred in accordance with Title 15 USC 638</p> <p>FY 2020 Plans: Funding transferred in accordance with Title 15 USC 638</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638</p>			- 1.559 -
Accomplishments/Planned Programs Subtotals			21.092 34.342 44.614
<p>Congressional Add: High Powered Microwave Test and Evaluation Assets</p> <p>FY 2020 Plans: High Powered Microwave Test and Evaluation Assets</p>			FY 2019 FY 2020
Congressional Adds Subtotals			- 10.000
<p>C. Other Program Funding Summary (\$ in Millions)</p> <p>N/A</p> <p>Remarks</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / <i>Major T&E Investment</i>	Project (Number/Name) 984 / <i>Major Developmental Testing Instrumentation</i>
D. Acquisition Strategy N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment					Project (Number/Name) 986 / Major Operational Test Instrumentation			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
986: Major Operational Test Instrumentation	-	15.150	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			

A. Mission Description and Budget Item Justification

This Project funds the development, acquisition, and integration of major operational test instrumentation for the U.S. Army Test and Evaluation Command's Operational Test Command and supporting test activities at test and training ranges. Requirements for instrumentation are identified through a long range survey of project managers, Research Development and Engineering Centers (RDECs), and Battle Laboratories developing future weapon systems and the test programs that support these systems. Project focus is to address Director Operational Test and Evaluation (DOT&E)-identified Army test shortfalls.

Projects are designated as a major test program based on their visibility, assessed relative technical risk (medium-high), schedule risk, cost (greater than 1.500 million per year or 7.500 million for the total project) and applicability to other mission areas or services. These projects are technically demanding, state-of-the-art, unique instrumentation assets or suites to meet the technology shortfalls, and generally result from development programs managed by a professional project management team.

The DOT&E annual report to Congress identified shortfalls in the Army's abilities to create realistic operational environments. The Integrated Live-Virtual-Constructive (LVC) Test Environment (ILTE) project will address multiple shortfalls identified by DOT&E. ILTE is a portfolio of related development efforts that will deliver a system of systems to provide a Real-Time Casualty Assessment (RTCA) and instrumentation suite that delivers a high fidelity, realistic, real-time capability to measure hardware and personnel performance in modern combat environments. ILTE will enable testing under tactical conditions for small and large-scale operations while integrating network operations and effects in support of the Army Equipment Modernization Plan. ILTE also allows the U.S. Army to test all Current-to-Future weapon systems in a realistic operational environment. ILTE will transition Research, Development, Test and Evaluation (RDTE) developed performance enhancements and technology upgrades to the operational test command, control, and communications, communications network, weapons system interfaces, vehicle and dismounted-troop kits and peripherals, Global Positioning System (GPS), encryption components, and integrate operational realistic digital battlefield data collection and analysis tools. These tools will collect, store and analyze data from the digital battlefield. Improvements will enable the ILTE system of systems to measure and record accrued damage, levels of exposure, effects of countermeasures, evasive action, and instrument threat vehicles. This capability is required by the operational test community to integrate digital battlefield data collection and analysis tools into the Network Integration Evaluations (NIEs), M1A2 Abrams, M2A4 Bradley, Stryker, Armored Multi-Purpose Vehicle (AMPV), Apache AH-64E, Gray Eagle and other operational tests.

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

Title: Integrated Live-Virtual-Constructive (LVC) Test Environment (ILTE) - formerly "Real-Time Casualty Assessment (RTCA)"

Description: Complete Block 1 of the Engineering, Manufacturing, and Development (EMD) Phase and acquisition of ILTE capabilities required to conduct Operational Tests.

	FY 2019	FY 2020	FY 2021
	15.150	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / <i>Major T&E Investment</i>	Project (Number/Name) 986 / <i>Major Operational Test Instrumentation</i>
B. Accomplishments/Planned Programs (\$ in Millions)	Accomplishments/Planned Programs Subtotals	FY 2019 FY 2020 FY 2021
		15.150 - -
C. Other Program Funding Summary (\$ in Millions)		
N/A		
Remarks		
D. Acquisition Strategy		
N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 6					PE 0604759A / Major T&E Investment				EY9 / Range Radar Replacement Program (RRRP)				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
EY9: Range Radar Replacement Program (RRRP)	-	22.272	94.760	54.322	-	54.322	12.968	21.380	25.545	33.110	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			

A. Mission Description and Budget Item Justification

In order to effect strategic overmatch on current and future battlefields, it is essential that the United States (U.S.) Army provide advanced radar system instrumentation for developmental testing. Since existing range radar instrumentation is aged beyond useful life and cannot adequately support emerging test requirements, the Range Radar Replacement Program (RRRP) recapitalizes and develops modern instrumentation radars to replace obsolete tracking and surveillance radars at U.S. Army Test and Evaluation Command's (ATEC) activities, which include: Aberdeen Test Center (ATC), MD; White Sands Test Center (WSTC), NM; and Yuma Test Center (YTC), AZ. The project will deliver capability in two block increments: Block I will recapitalize or replace existing radar systems, and Block II will develop a Long Range Radar which is compliant with ATEC's Test Capability Requirements Document (TCRD). The acquisition of modern instrumentation radar systems will provide the Army with critical testing data essential for the development of next generation technology and advanced system capabilities. The RRRP provides the test centers with improved radar resolution, sensitivity, accuracy, clutter suppression, and reliability. The planned solution to meet program requirements consists of four primary items: Long Range Single Object Tracking Radars (SOTR), Long Range Multiple Object Tracking Radars (MOTR), Medium Range Radars (MRR), and Short Range Radars (SRR). The resulting systems will not only reduce operation and sustainment costs for the ranges, but will improve data collection, thus enhancing development of Army systems being tested at these ranges. The current fleet of instrumentation radars located at ATC, WSTC, and YTC has become antiquated to the extent that they are not able to support the test needs of the test centers.

This Project will procure commercial off-the-shelf (COTS) and/or modified commercial off-the-shelf (MCOTS) radars for both the MRR and SRR solutions, and a combination of recapitalization and COTS/MCOTS replacement for the Long Range SOTRs. Also, the project will conduct Engineering and Manufacturing Development (EMD) for upgrading three Long Range MOTRs.

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

Title: EMD Phase

Description: EMD phase activities for RRRP are designed to provide advanced radar instrumentation suites that meet emerging requirements for developmental testing.

FY 2020 Plans:

Will continue procurement of MRRs and LRRs. Will continue EMD and initial acceptance testing of MPR-39 MOTR and Long range Radar (LRR). Will continue delivery and acceptance testing of MRRs with vendors and ATEC ranges. Procures seven

	FY 2019	FY 2020	FY 2021
	22.272	90.456	54.322

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment	Project (Number/Name) EY9 / Range Radar Replacement Program (RRRP)	
B. Accomplishments/Planned Programs (\$ in Millions) additional radars and accelerates the program by one year. This acceleration is designed to align program requirements with Army Modernization Priorities in support of the National Defense Strategy.			FY 2019
FY 2021 Plans: Continue procurement of MCOTS long range radars, initiate the EMD phase for the first Block II LRR, and complete acceptance testing of instrumentation radars.			FY 2020
FY 2020 to FY 2021 Increase/Decrease Statement: Decrease of \$40.438 million is consistent with the strategic plan to align RRRP with developmental testing requirements emerging from Army modernization efforts.			FY 2021
Title: FY 2020 SBIR/STTR Transfer		-	4.304
Description: Funding transferred in accordance with Title 15 USC 638			
FY 2020 Plans: Funding transferred in accordance with Title 15 USC 638			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638			
Accomplishments/Planned Programs Subtotals			22.272
C. Other Program Funding Summary (\$ in Millions)			94.760
N/A			54.322
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment					Project (Number/Name) FA4 / Warrior Injury Assessment Manikin (WIAMan)			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
FA4: Warrior Injury Assessment Manikin (WIAMan)	-	13.665	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-	
A. Mission Description and Budget Item Justification													
The Warrior Injury Assessment Manikin (WIAMan) Anthropomorphic Test Device (ATD) Project will develop and produce Warrior-representative ATDs that incorporate realistic, biomechanically-validated injury features and assessment tools to better characterize dynamic events and injury risks measured in Live Fire Test & Evaluation (LFT&E) and vehicle development efforts. This capability is comprised of an ATD system built for the Title 10 LFT&E environment and associated biomechanics data and analysis tools. The current manikins do not represent the modern Warrior and were not designed for the vertical acceleration environment associated with underbody blast (UBB) events. Consequently, current LFT&E crew survivability assessment devices are limited in their ability to predict the types and severity of injuries seen in these events. Due to this technology gap, military ground vehicles are being fielded without fully defined levels of injury risk and crew survivability for UBB events. The device produced by this Project will be used to satisfy a critical need for scientifically valid capability for analyzing the risk of injury caused by UBB.													
B. Accomplishments/Planned Programs (\$ in Millions)													
Title: WIAMan/ATD										13.665	-	-	
Description: This Project will provide the Army Test and Evaluation Command and Army Research Laboratory with a Warrior-representative blast test manikin and data acquisition system to assess the risk of injury during underbody blast testing of military ground vehicles.													
Accomplishments/Planned Programs Subtotals										13.665	-	-	
C. Other Program Funding Summary (\$ in Millions)													
N/A													
Remarks													
Biomechanical research supporting WIAMan is funded by the Defense Health Agency (DHA), Program Element PE 0603115DHA/Medical Technology Development Project 431A / Underbody Blast Testing (Army).													
D. Acquisition Strategy													
Technology transfer from Research and Development Command (RDECOM). Contract for the Anthropomorphic Test Devices (ATDs) with industry leveraging the technology data package provided by RDECOM.													

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army										Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment				Project (Number/Name) FF1 / Cyber Blue Team			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
FF1: Cyber Blue Team	-	0.000	1.216	1.054	-	1.054	1.098	2.261	1.114	1.114	0.000	7.857
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	

A. Mission Description and Budget Item Justification

In 2016 the Army Acquisition Executive (AAE) designated the Program Manager for Cyber, and Training (PM CT2) (formerly PM ITTS) as the Office of Primary Responsibility for Cyber Acquisition Blue Teams (CABT) certifications and standards program. This Project executes the establishment and management of certification standards for CABT and coordination of requirements on behalf of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology (ASA ALT).

PM CT2 will establish certification standards, certify Blue Teams and maintain a vulnerabilities/lessons learned repository. PM CT2 will work with Blue and Red Teams to establish processes which facilitate open network tests under the red team authority, coordinate with PMs on CABT efforts on behalf of ASA ALT and report to ASA ALT on new cyber vulnerabilities. Blue teams will work cooperatively with acquisition programs to make sure all security measures are taken throughout the program's lifecycle, ensuring cyber resiliency. Blue teams are essential to help military operators assess, protect and defeat the presence of cyber security threats across Army Acquisition Programs.

Will focus on the continuation of certifying candidate teams. The goal is to certify enough teams to allow acquisition programs the flexibility to find a certified Blue Team that meet their program's schedule and cost and can be incorporated early on in the program. CABT vulnerability assessments will provide data analytics to report trends and lessons learned. A web portal will serve as a one stop shop for both candidate and certified Blue teams to obtain and maintain their certification.

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

Title: Cyber Blue Teams

Description: Management and oversight of Cyber Blue Team vulnerability assessments.

FY 2020 Plans:

Will develop a central repository for vulnerability assessments. Will continue to manage certification standards for Cyber Blue Teams in coordination with all Project Managers on behalf of ASA ALT. The Cyber Blue Teams standards office will be the single point of contact with United States Cyber Command (CYBERCOM) for open and closed networks.

FY 2021 Plans:

Will continue to support the maintenance and operation of a central repository to include trend analysis and lessons learned from vulnerability assessments. The CABT program will also develop and maintain an additional web portal to support and manage both the candidate and the certified teams.

FY 2020 to FY 2021 Increase/Decrease Statement:

	FY 2019	FY 2020	FY 2021
	-	1.161	1.054

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0604759A / Major T&E Investment	Project (Number/Name) FF1 / Cyber Blue Team
B. Accomplishments/Planned Programs (\$ in Millions) Decreased in funding due to an anticipated drop in the number of candidate team certification requests after the initial start of team certifications.	FY 2019	FY 2020
Title: FY 2020 SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC 638	-	0.055
FY 2020 Plans: Funding transferred in accordance with Title 15 USC 638	-	-
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638	-	-
Accomplishments/Planned Programs Subtotals		1.216 1.054
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy N/A		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0605103A / Rand Arroyo Center							
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	19.071	13.113	13.481	-	13.481	14.091	14.512	14.939	15.090	0.000	104.297
732: Arroyo Center Spt	-	19.071	13.113	13.481	-	13.481	14.091	14.512	14.939	15.090	0.000	104.297
A. Mission Description and Budget Item Justification												
This Program Element (PE) funds RAND Arroyo Center, the Department of the Army's Federally Funded Research and Development Center (FFRDC) for studies and analysis. RAND Arroyo Center draws researchers from RAND's staff of nearly 700 professionals trained in a broad range of disciplines. Most staff members work in RAND's principal locations: Santa Monica, California; Arlington, Virginia; and Pittsburgh, Pennsylvania. RAND Arroyo Center provides for continuing analytical research across a broad spectrum of issues and concerns, grouped in three major research areas: Personnel, Training, and Health; Forces and Logistics; and Strategy, Doctrine and Resources. RAND Arroyo Center research agenda is primarily focused on mid/long-term concerns. Current priorities include: implementation of the National Defense Strategy; total force readiness; Army modernization priorities; ongoing operations and dynamic force employment; reform business processes; multi-domain operations; and soldier-centric investments and soldier and family resilience. Results and analytical findings directly affect senior leadership deliberations on major issues. RAND Arroyo research is sponsored by the Secretary, Chief of Staff, Under Secretary, Vice Chief of Staff, Deputy Chiefs of Staff; Assistant Secretaries of the Army, and Army Major Commands. RAND Arroyo is governed by AR 5-21 and receives Army guidance through the Arroyo Center Policy Committee (ACPC), which is co-chaired by the Vice Chief of Staff of the Army and the Assistant Secretary of the Army (Acquisition, Logistics and Technology). The ACPC reviews, monitors, and approves the annual Arroyo Center research plan. Each research project is sponsored by a General Officer or Senior Executive Service who is continually involved in research evaluation and feedback. RAND Arroyo provides the Army with a unique multidisciplinary capability for independent analysis.												
B. Program Change Summary (\$ in Millions)					FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total			
Previous President's Budget					19.796	13.113	13.494	-	13.494			
Current President's Budget					19.071	13.113	13.481	-	13.481			
Total Adjustments					-0.725	0.000	-0.013	-	-0.013			
<ul style="list-style-type: none"> • Congressional General Reductions • Congressional Directed Reductions • Congressional Rescissions • Congressional Adds • Congressional Directed Transfers • Reprogrammings • SBIR/STTR Transfer • Adjustments to Budget Years 					-	-	-	-	-			
					-0.725	-	-	-0.013	-0.013			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605103A / Rand Arroyo Center				Project (Number/Name) 732 / Arroyo Center Spt				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
732: Arroyo Center Spt	-	19.071	13.113	13.481	-	13.481	14.091	14.512	14.939	15.090	0.000	104.297	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-	

A. Mission Description and Budget Item Justification

This Program Element (PE) funds RAND Arroyo Center, the Department of the Army's Federally Funded Research and Development Center (FFRDC) for studies and analysis. RAND Arroyo Center draws researchers from RAND's staff of nearly 700 professionals trained in a broad range of disciplines. Most staff members work in RAND's principal locations: Santa Monica, California; Arlington, Virginia; and Pittsburgh, Pennsylvania. RAND Arroyo Center provides for continuing analytical research across a broad spectrum of issues and concerns, grouped in three major research areas: Personnel, Training, and Health; Forces and Logistics; and Strategy, Doctrine and Resources. RAND Arroyo Center research agenda is primarily focused on mid/long-term concerns. Current priorities include: implementation of the National Defense Strategy; total force readiness; Army modernization priorities; ongoing operations and dynamic force employment; reform business processes; multi-domain operations; and soldier-centric investments and soldier and family resilience. Results and analytical findings directly affect senior leadership deliberations on major issues. RAND Arroyo research is sponsored by the Secretary, Chief of Staff, Under Secretary, Vice Chief of Staff, Deputy Chiefs of Staff; Assistant Secretaries of the Army, and Army Major Commands. RAND Arroyo is governed by AR 5-21 and receives Army guidance through the Arroyo Center Policy Committee (ACPC), which is co-chaired by the Vice Chief of Staff of the Army and the Assistant Secretary of the Army (Acquisition, Logistics and Technology). The ACPC reviews, monitors, and approves the annual Arroyo Center research plan. Each research project is sponsored by a General Officer or Senior Executive Service who is continually involved in research evaluation and feedback. RAND Arroyo provides the Army with a unique multidisciplinary capability for independent analysis.

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

	FY 2019	FY 2020	FY 2021
Title: Research addressing personnel, training, and health	4.341	2.673	2.953
Description: Addresses key issues for the Army including: total workforce management; recruiting and retention; leader development; training, readiness and effectiveness; Soldier and family wellness and support.			
FY 2020 Plans: The Planned Study program will cover key issues for the Army including: total workforce management; recruiting and retention; leader development; training readiness and effectiveness; Soldier and family wellness and support. Each research project will be sponsored by a General Officer (or Senior Executive Service (SES) equivalent) who validates the need for the project and directly participates in research evaluation and iterative feedback. Project results will be briefed to Army senior leaders to ensure recommendations are available for immediate consideration.			
FY 2021 Plans: The Planned Study program will cover key issues for the Army including: total workforce management; recruiting and retention; leader development; training readiness and effectiveness; Soldier and family wellness and support. Each research project will be sponsored by a General Officer (or Senior Executive Service (SES) equivalent) who validates the need for the project and			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605103A / Rand Arroyo Center	Project (Number/Name) 732 / Arroyo Center Spt	
B. Accomplishments/Planned Programs (\$ in Millions) directly participates in research evaluation and iterative feedback. Project results will be briefed to Army senior leaders to ensure recommendations are available for immediate consideration. FY 2020 to FY 2021 Increase/Decrease Statement: Funding change reflects planned lifecycle of this effort.			FY 2019
Title: Research addressing forces and logistics		5.700	4.068
Description: Addresses key issues for the Army, including systems and technology analysis; networks and Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR); acquisition policy; force and organizational development; assessment of tactics, techniques, and procedures; supply chain management; fleet maintenance, management and modernization; and tactical, operational, and strategic logistic support			4.718
FY 2020 Plans: The Planned Study Program in forces and logistics will include key issues for the Army such as systems and technology analysis; networks and C4ISR; acquisition policy; force and organizational development; assessment of tactics, techniques, and procedures; supply chain management; fleet maintenance, management and modernization; and tactical, operational, and strategic logistic support.			
FY 2021 Plans: The Planned Study Program in forces and logistics will include key issues for the Army such as systems and technology analysis; networks and C4ISR; acquisition policy; force and organizational development; assessment of tactics, techniques, and procedures; supply chain management; fleet maintenance, management and modernization; and tactical, operational, and strategic logistic support.			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding change reflects planned lifecycle of this effort.			
Title: Research addressing strategy, doctrine, and resources		9.030	5.776
Description: Addresses key issues for the Army including: preparing for strategic competition with near peer adversaries; building the Army of the Future through modernization and new operational constructs; optimizing posture and use of military forces abroad; working with partners and allies; identifying and countering ongoing and emerging threats to national interests; and assessing risk and resource use.			5.810
FY 2020 Plans: The Planned Study Program in strategy, doctrine, and resources will include current and potential threats to national interests and U.S. forces; operating environments and their implications for the Army; doctrine and operational concepts for addressing threats;			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605103A / Rand Arroyo Center	Project (Number/Name) 732 / Arroyo Center Spt	
B. Accomplishments/Planned Programs (\$ in Millions) operating and generating force size, scope, and mix to meet demand; building partner capabilities; learning from past and present operations; strategic risk analysis and resource policy; and Army wargames and related analyses.			FY 2019 FY 2020 FY 2021
FY 2021 Plans: The Planned Study Program in strategy, doctrine, and resources will include preparing for strategic competition with near peer adversaries; building the Army of the Future through modernization and new operational constructs; optimizing posture and use of military forces abroad; working with partners and allies; identifying and countering ongoing and emerging threats to national interests; and assessing risk and resource use.			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding change reflects planned lifecycle of this effort.			
Title: FY 2020 SBIR/STTR Transfer		-	0.596
Description: Funding transferred in accordance with Title 15 USC ?638			
FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals			19.071 13.113 13.481
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0605301A / Army Kwajalein Atoll							
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	237.414	238.691	231.824	-	231.824	231.405	236.592	244.958	247.487	0.000	1,668.371
DW7: Army Kwajalein Atoll Facilities Sustainment	-	20.200	45.255	47.070	-	47.070	48.385	50.447	53.906	54.464	0.000	319.727
DW8: Army Kwajalein Atoll Installation Services	-	138.419	124.738	123.923	-	123.923	124.351	126.520	130.824	132.668	0.000	901.443
DW9: Army Kwajalein Atoll Restoration And Modernization	-	68.513	57.887	49.312	-	49.312	46.995	47.923	48.402	48.407	0.000	367.439
DX2: Army Kwajalein Test Ranges and Mission Support	-	10.282	10.811	11.519	-	11.519	11.674	11.702	11.826	11.948	0.000	79.762

A. Mission Description and Budget Item Justification

This Program Element (PE) is unique in the Research, Development, Test & Evaluation (RDTE) portfolio due to the comprehensive scope of RDTE funding at United States (U.S.) Army Garrison Kwajalein Atoll, directly supporting eleven leased islands with radars, telemetry, and optics in support of continuous New Foreign Launch surveillance, space surveillance, space object identification, offensive and defensive strategic ballistic and interceptor missile testing. In addition, responsibilities include provision of the totality of the logistics and municipal services required to maintain a strategically vital mission support infrastructure in a remote Pacific island chain 2,300 miles southwest of Hawaii. Kwajalein's flexible electromagnetic frequency spectrum, equatorial locale, deep water, and unmatched instrumentation make the nation's space and missile operations possible. In addition, the Ronald Reagan Ballistic Missile Defense Test Site (RTS) on Kwajalein is the Department of Defense's (DoD) only land-impact missile testing site, providing an increasingly vital Test & Evaluation (T&E) capability.

The U.S. Army Kwajalein Atoll / Ronald Reagan Ballistic Missile Defense Test Site (USAKA/RTS), located in the Republic of the Marshall Islands, is a remote, secure activity of the Major Range and Test Facility Base (MRTFB). USAKA/RTS supports test and evaluation of major Army and DoD missile and space acquisition programs and provides New Foreign Launch surveillance and space operations (surveillance and object identification) in support of U.S. Strategic Command (USSTRATCOM), the U.S. Air Force, and National Aeronautics and Space Administration (NASA) scientific and space programs. USAG-KA provides Base Operations (BOS), Infrastructure and Services (Projects DW7, DW8, and DW9) support to the USAKA/RTS mission and other resident Programs (i.e. Army missile defense, Air Force & Navy Intercontinental Ballistic Missile (ICBM) developmental and operational tests; Army, Air Force, Navy and Defense Advanced Research Projects Agency (DARPA) hypersonic developmental tests; Air Force Space Fence, Missile Defense Agency (MDA) operational /demonstration/ validation tests; USSTRATCOM space situational awareness requirements (including contributions to the U.S. Space Surveillance Network); and space experiments). Base Operations Services at Kwajalein Atoll are conducted predominantly through a contracted workforce with governmental oversight. These PE-funded contracts provide: installation/base operations and maintenance for all facilities, logistics, and security; power generation fuel supporting the installation and radars; transportation; and mission essential bandwidth via a fiber optic cable system.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army				Date: February 2020	
Appropriation/Budget Activity	R-1 Program Element (Number/Name)				
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support	PE 0605301A / Army Kwajalein Atoll				
The Network Enterprise Technology Command (NETCOM) utilizes Project DX2 to provide civilian pay, manpower service contracts, supporting Information Technology (IT), equipment, and associated costs specifically identified and measurable to plan, manage, coordinate, and execute Information Technology Services Management at Army Kwajalein Test Ranges. This Project provides C4IM services in accordance with the Department of Army Pamphlet (DA PAM) PAM 25-1-1 and the Army C4IM Services List.					
B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	246.275	238.691	234.760	-	234.760
Current President's Budget	237.414	238.691	231.824	-	231.824
Total Adjustments	-8.861	0.000	-2.936	-	-2.936
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-8.861	-			
• Adjustments to Budget Years	-	-	-2.936	-	-2.936

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605301A / Army Kwajalein Atoll					Project (Number/Name) DW7 / Army Kwajalein Atoll Facilities Sustainment			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
DW7: Army Kwajalein Atoll Facilities Sustainment	-	20.200	45.255	47.070	-	47.070	48.385	50.447	53.906	54.464	0.000	319.727	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification													
This Project provides resources for preventive maintenance and repair necessary to sustain 1,477 facilities on Kwajalein, Roi-Namur, and nine other leased islands, totaling 2.6 million square feet. Funds are focused toward keeping facilities in good working order in accordance with industry standards. This includes emergency response and service calls, minor repair and major repair or replacement resulting from Kwajalein's particularly harsh climate, including strong winds, saltwater corrosion, and sustained torrential rainfall. Funds also provide manpower necessary to achieve, evaluate, and sustain compliance with appropriate Federal, State, and local environmental laws, Executive Orders, Department of Defense (DoD) Directives, regulations, and overseas country-specific Final Governing Standards.													
B. Accomplishments/Planned Programs (\$ in Millions)													
Title: Army Family Housing (AFH) Maintenance										0.003	-	-	
Description: Provided the operations to support a Family Housing (FH) inventory consisting of 372 units, Billeting consisting of 147 transient rooms, and Unaccompanied Personnel Housing dormitory inventory consisting of 692 units.													
Title: Real Property Maintenance										20.197	45.139	46.949	
Description: This effort provides the preventive maintenance and repair necessary to sustain Kwajalein facilities and utilities in order to prevent further deterioration. Funds facilities and utilities at minimum acceptable levels to mitigate risk of catastrophic failures. Includes regularly scheduled adjustments and inspections, preventive maintenance tasks, and emergency response and service calls for minor repairs. Also includes costs of major repairs or replacement of facility components that are expected to occur periodically throughout the expected service life. This work includes: regular roof replacement; refinishing wall surfaces; repairing and replacing electrical, plumbing, and cooling systems; replacing tile and carpeting; and similar types of work. Sustainment, however, is not intended to keep facilities adequately functioning beyond their expected service lives.													
FY 2020 Plans: Will continue to service 1,477 facilities on Kwajalein, Roi-Namur, and the nine other leased islands, totaling 2.6 Million square feet. Will continue an aggressive maintenance plan based on the significant corrosive environment; prepare maintenance plans and schedules for recurring or preventive maintenance; perform periodic pre-maintenance inspections; perform preventive and corrective maintenance; report the need for major repair, replacement, or rehabilitation; prepare records of maintenance actions performed and deficiencies discovered; and perform post-maintenance inspections.													
FY 2021 Plans:													

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605301A / Army Kwajalein Atoll	Project (Number/Name) DW7 / Army Kwajalein Atoll Facilities Sustainment			
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021	
Will continue to service 1,477 facilities on Kwajalein, Roi-Namur, and the nine other leased islands, totaling 2.6 Million square feet. Will continue an aggressive maintenance plan based on the significant corrosive environment; prepare maintenance plans and schedules for recurring or preventive maintenance; perform periodic pre-maintenance inspections; perform preventive and corrective maintenance; report the need for major repair, replacement, or rehabilitation; prepare records of maintenance actions performed and deficiencies discovered; and perform post-maintenance inspections.					
FY 2020 to FY 2021 Increase/Decrease Statement: Realignment of funding to meet Facility Sustainment Goals					
Title: Environmental Quality Description: This effort provides manpower necessary to achieve, evaluate, and sustain compliance with appropriate Federal, State, and local environmental laws, Executive Orders, DoD Directives, regulations, and overseas country-specific Final Governing Standards, in order to protect human health and safety and reduce total cost to the Army through environmental compliance, conservation, and pollution prevention. Enables installations to comply with legal environmental mandates and critical stewardship responsibilities that impact management and modernization of installations, while sustaining natural and cultural resources in a manner that provides continued access and long-term use of training lands to support the Army's installation missions.. FY 2020 Plans: Will continue oversight and management of environmental workload. FY 2021 Plans: Will continue oversight and management of environmental workload FY 2020 to FY 2021 Increase/Decrease Statement: Programmatic Economic Adjustments		-	0.116	0.121	
Accomplishments/Planned Programs Subtotals			20.200	45.255	47.070
C. Other Program Funding Summary (\$ in Millions)					
N/A					
Remarks					
D. Acquisition Strategy					
N/A					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
DW8: Army Kwajalein Atoll Installation Services	-	138.419	124.738	123.923	-	123.923	124.351	126.520	130.824	132.668	0.000	901.443
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	
A. Mission Description and Budget Item Justification												
This Project resources Base Operations / Installation Services Support for United States (U.S.) Army Kwajalein (USAKA) Garrison located in the Republic of the Marshall Islands, a remote, secure activity designated as a Major Range and Test Facility Base (MRTFB). Base Operations / Installation Services Support resourcing is a critical enabler to ensure continuity of operations supporting Test and Evaluation and Space Operations of the Ronald Reagan Ballistic Missile Test Site in its role as an MRTFB Activity. Kwajalein is a government-managed / contractor-operated (GOCO) site and is primarily dependent upon its associated support contracts for the daily operations and maintenance of Base Operations / Installation Services Support. Installation Services Support consists of: Utility Services; logistical (fuel/transportation) operations support requirements; Medical/Dental Services; Education (K-12) Services; Food/Grocery Services; Contracted Security Guards; and Aviation/Marine support.												
B. Accomplishments/Planned Programs (\$ in Millions)												
Title: Army Family Housing (AFH) Operations												
Description: Description: Funds all costs associated with the operations of a residence to include management, services, furnishing and utilities.												
Title: Army Airfields (AAF) and Heliports (AHP)												
Description: Provides Resources Operations and Maintenance for Army Airfield and Aviation Fleet. Provides manpower, equipment acquisition, sustainment and maintenance in support of airfield operations, airfield management, aircraft services, air traffic services (ATS), air transport, airspace management and control, and air traffic control equipment maintenance. Includes airfield specific equipment, safety requirements, Hazardous Materials (HAZMAT) support, and airfield obstruction surveys. AAF/AHP functions support Department of Defense (DoD) priorities for Army and joint force capabilities and inter-agency, intra-agency and multinational operations to meet current and future full spectrum requirements. Funds AAF/AHP functions at the necessary state of readiness to support missions across eleven islands (two fixed wing/six rotator wing) in addition to international aircraft traffic and reduces risk of major accidents/incidents.												
FY 2020 Plans: Provide services for all mission essential DoD, commercial, and transient aircraft. Operate two Airfields and eight outer islands helipads. Operate and maintain one Air Traffic Control (ATC) tower with class D airspace, two separate airfield operations and												
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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605301A / Army Kwajalein Atoll	Project (Number/Name) DW8 / Army Kwajalein Atoll Installation Services		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
<p>integrated STARS radar for aircraft separation and de-confliction. Support all intra-atoll cargo and personnel movements with two fixed wing and four rotary wing aircraft. Support transient international flights.</p> <p>FY 2021 Plans: Provide services for all mission essential DoD, commercial, and transient aircraft. Operate two Airfields and eight outer islands helipads. Operate and maintain one Air Traffic Control (ATC) tower with class D airspace, two separate airfield operations and integrated STARS radar for aircraft separation and de-confliction. Support all intra-atoll cargo and personnel movements with two fixed wing and four rotary wing aircraft. Support transient international flights.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Programmatic Economic Increase</p>				
<p>Title: Army Community Services (ACS)</p> <p>Description: Provides programs that prevent family violence/fatalities through family advocacy programs and counseling; provide specialized assistance to provide prevention, education and family sustainment for military and civilian personnel and their families; and also provide critical financial, employment and relocation education and training to Soldiers, civilians, and their Families.</p> <p>FY 2020 Plans: Continue to provide necessary/routine Army Community Services to the Installation.</p> <p>FY 2021 Plans: Continue to provide necessary/routine Army Community Services to the Installation.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Programmatic Economic INcrease</p>				0.065 0.273 0.283
<p>Title: Child and Youth Services (CYS)</p> <p>Description: Provides child care, youth, and school services (CYSS) programs for children and youth. Provides child and youth spaces required to meet Army's child care and youth participation demand goals. Resources the following programs: 1) Child Development Centers; 2) Family Child Care; 3) School Age Care; 4) Youth Programs; 5) Youth Sports & Fitness; 6) School Support Services. Resources staffing levels necessary to minimize risk of child abuse, and the oversight to achieve and maintain DoD Certification (State licensing equivalent) and National Accreditation per statutory requirement and DoD policy.</p> <p>FY 2020 Plans: Continue to provide resources to operate CYS programs on Kwajalein to include a Child Development Center, School Age Services programs, Supplemental Programs and Services, and Youth programs and services. Establish and maintain</p>				1.280 0.417 0.427

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Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 6	PE 0605301A / Army Kwajalein Atoll	DW8 / Army Kwajalein Atoll Installation Services	
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
developmentally and age-appropriate staff-child/youth interactions, activities, activity schedules and plans, supplies and equipment, furnishings, and environment (both indoors and outdoors) that lead to the social, physical, cognitive, and emotional growth of children up to 18 years. Ensure that youth programs include, at a minimum, seasonal sports programs, 4-H Club programs, Boys and Girls Club of America programs, instructional programs, recreational programs, programs that promote leadership and citizenship, intervention services, and teen programs.			
FY 2021 Plans: Continue to provide resources to operate CYS programs on Kwajalein to include a Child Development Center, School Age Services programs, Supplemental Programs and Services, and Youth programs and services. Establish and maintain developmentally and age-appropriate staff-child/youth interactions, activities, activity schedules and plans, supplies and equipment, furnishings, and environment (both indoors and outdoors) that lead to the social, physical, cognitive, and emotional growth of children up to 18 years. Ensure that youth programs include, at a minimum, seasonal sports programs, 4-H Club programs, Boys and Girls Club of America programs, instructional programs, recreational programs, programs that promote leadership and citizenship, intervention services, and teen programs.			
FY 2020 to FY 2021 Increase/Decrease Statement: Programmatic Economic Increase			
Title: Engineering Services Description: Provides (1) Facility Management and Administration and (2) Installation Engineering Services. Facility Management includes public works management costs, contract management, material procurement, facility data management; to include, Geographic Information System (GIS) and Sustainment Management Systems (SMS) suite implementation/inspections, furnishings management costs, and real property and real estate management. Installation Engineering Services includes facility engineer service contracts, annual inspection of facilities, master planning, overhead of planning and design, and overhead of construction management and non-Sustainment and Restoration Modernization (SRM) service calls. Excludes: vehicle maintenance, in-house shop and contracted personnel who routinely perform facility sustainment activities; and design engineers or project managers or construction inspectors who manage and oversee facility sustainment and construction projects.	1.952	4.286	4.386
FY 2020 Plans: Continue to provide necessary/routine engineering services to the Installation.			
FY 2021 Plans: Continue to provide necessary/routine engineering services to the Installation.			
FY 2020 to FY 2021 Increase/Decrease Statement:			

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Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 6	PE 0605301A / Army Kwajalein Atoll	DW8 / Army Kwajalein Atoll Installation Services	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020
Programmatic Economic Increase			
Title: Soldier Recreation and Community Support		3.885	0.240
Description: Provides the development and delivery of Soldier Programs, Community Recreation, and Direct Common Family and Morale, Welfare and Recreation (FMWR) Support Services that sustain the Total Army, in accordance with (IAW) the Army Campaign Plan and the Chief of Staff of the Army (CSA)'s Strategic Priorities. Programs funded include sports, fitness and aquatics, recreation centers, libraries, outdoor recreation, skill development, bowling (16 lanes or less); Direct Common FMWR Support Services (essential command and control and risk management programs for property, funds and personnel); and as designated by Congress, Category C FMWR activities at remote and isolated sites. These programs resource readiness and resiliency and build upon physical, emotional, social and psychological coping skills; funds opportunities for Soldiers, civilians and Families to foster self-reliance, morale and a sense of belonging by offering positive discretionary time choices, mitigating aberrant behaviors through individual skill development and team participation.		0.250	
FY 2020 Plans: Continue to provided resources necessary to sustain Soldier Recreation and Community Support for a community population of 1400 and meet the needs of USAKA/RTS residents, tenants, satellite activities, range users, and other authorized organizations/personnel on Kwajalein Island, Roi-Namur Island, Meck Island, and on other USAKA/RTS outer islands.			
FY 2021 Plans: Continue to provided resources necessary to sustain Soldier Recreation and Community Support for a community population of 1400 and meet the needs of USAKA/RTS residents, tenants, satellite activities, range users, and other authorized organizations/personnel on Kwajalein Island, Roi-Namur Island, Meck Island, and on other USAKA/RTS outer islands.			
FY 2020 to FY 2021 Increase/Decrease Statement:			
Programmatic Economic Increase			
Title: Fire and Emergency Services (FES)		6.692	4.832
Description: Provides for fire and emergency services for the installation, including preparation for and response and mitigation of aircraft and structural firefighting and rescue, technical rescue, Hazardous Materials and Weapons of mass destruction/Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) responses, and out of control wildfire mitigation in an all-hazard response environment.			5.003
FY 2020 Plans: Continue to provide fire and Emergency Services which are performed in association with the Base Support/Logistics contractor. Provide fire protection services for all USAG-KA and RTS assets, to include facilities, structural, aircraft, shipboard and small watercraft, and wild land fires. Services provide protection for the fire hazards associated with operations and community at			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605301A / Army Kwajalein Atoll	Project (Number/Name) DW8 / Army Kwajalein Atoll Installation Services	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	
USAG-KA and RTS. Provide Fire Protection on Kwajalein and Roi-Namur 24 hours Provided Fire Protection and Emergency Services on Meck during duty hours, mission periods, and hazardous operations. Provide ambulance service on Kwajalein, Meck, and Roi-Namur Islands. Provide fire safety education and activities for the schools and child development center and for adult residents of USAG-KA. Train personnel normally assigned to work on the remote islands of Illeginni, Ennylabegan, Gagan, and Legan in first aid, Cardiopulmonary Resuscitation (CPR), and operation of fire extinguishers and fire alarm and suppression equipment peculiar to the island. Provide rescue and emergency medical personnel available for immediate dispatch to aircraft or vessel crash site, entry into the ocean or lagoon, and be provisioned for immediate rescue and emergency medical assistance.			
FY 2021 Plans: Continue to provide fire and Emergency Services which are performed in association with the Base Support/Logistics contractor. Provide fire protection services for all USAG-KA and RTS assets, to include facilities, structural, aircraft, shipboard and small watercraft, and wild land fires. Services provide protection for the fire hazards associated with operations and community at USAG-KA and RTS. Provide Fire Protection on Kwajalein and Roi-Namur 24 hours Provided Fire Protection and Emergency Services on Meck during duty hours, mission periods, and hazardous operations. Provide ambulance service on Kwajalein, Meck, and Roi-Namur Islands. Provide fire safety education and activities for the schools and child development center and for adult residents of USAG-KA. Train personnel normally assigned to work on the remote islands of Illeginni, Ennylabegan, Gagan, and Legan in first aid, Cardiopulmonary Resuscitation (CPR), and operation of fire extinguishers and fire alarm and suppression equipment peculiar to the island. Provide rescue and emergency medical personnel available for immediate dispatch to aircraft or vessel crash site, entry into the ocean or lagoon, and be provisioned for immediate rescue and emergency medical assistance.			
FY 2020 to FY 2021 Increase/Decrease Statement: Programmatic Economic Increase			
Title: Financial Management (FM) Activities Description: Provides Directorate of Resource Management (DRM) and DRM base support for Army tenants resident on or receiving support from the Army installation. Functions of the DRM include program, budget, manpower, documentation, Memorandum of Understanding (MOU)/Memorandum of Agreement (MOA)/Support Agreement management, finance and accounting.	0.516	0.594	0.608
FY 2020 Plans: Continue to provide program/budget support and budget execution, financial advisory service and accounting liaison services. Support Audit Readiness through Statement of Budgetary Resource samples. Continue to establish Inter-service Support Agreements (ISSA). Provide management analysis on manpower requirements and organizational structure analysis. Provide Contracting Officer Representative oversight for the Program Management functions for the base-support contract.			
FY 2021 Plans:			

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Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 6	PE 0605301A / Army Kwajalein Atoll	DW8 / Army Kwajalein Atoll Installation Services	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020
Continue to provide program/budget support and budget execution, financial advisory service and accounting liaison services. Support Audit Readiness through Statement of Budgetary Resource samples. Continue to establish Inter-service Support Agreements (ISSA). Provide management analysis on manpower requirements and organizational structure analysis. Provide Contracting Officer Representative oversight for the Program Management functions for the base-support contract.			
FY 2020 to FY 2021 Increase/Decrease Statement: Programmatic Economic Increase			
Title: Food Services Description: Provides for the operation of dining facilities including contract employees, food service supplies, and equipment life-cycle replacement. FY 2020 Plans: Continue to provide services for DoD, contractor, host nation, interagency and intra-agency organizations with multiple facilities on three different islands to include 3 cafeterias, bakery, grocery store, dry/cold warehousing, AAFES retail stores, AAFES food court, and catering services and private organizations. Monitor and approve food purchases and preparation. Conduct food service inspections. FY 2021 Plans: Continue to provide services for DoD, contractor, host nation, interagency and intra-agency organizations with multiple facilities on three different islands to include 3 cafeterias, bakery, grocery store, dry/cold warehousing, AAFES retail stores, AAFES food court, and catering services and private organizations. Monitor and approve food purchases and preparation. Conduct food service inspections.	8.209	8.865	9.178
FY 2020 to FY 2021 Increase/Decrease Statement: Programmatic Economic Increase			
Title: Unaccompanied Housing Description: Provides for Government-owned Unaccompanied Housing including appropriated funded Army lodging, lifecycle replacement furnishings, and other associated costs. Includes Manpower purchase, control, moving, management and handling of lifecycle replacement and repair for all unaccompanied housing furnishings. Includes all costs of authorized replacement furnishings in existing inventory. FY 2020 Plans: Continue to provide contractor management, oversight, M&R, and control of all USAG-KA Housing/ Billeting Facilities Utilize best commercial residential business practices to ensure basic quality of life standards are achieved and are in compliance with life	-	1.601	1.658

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2040 / 6	PE 0605301A / Army Kwajalein Atoll	DW8 / Army Kwajalein Atoll Installation Services	
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
<p>and safety standards. Provide Master Key control services. Provide and implement a sound furnishings and appliances program that addresses acquisition, replacement, M&R, and refurbishing. Provide Hospitality Kits consisting of the minimum essential items to operate a household until permanent party personnel's HHG arrive and from HHG shipment until departure. Provide COOM on all facilities prior to reassignment to in-coming resident.</p> <p>FY 2021 Plans: Continue to provide contractor management, oversight, M&R, and control of all USAG-KA Housing/ Billeting Facilities Utilize best commercial residential business practices to ensure basic quality of life standards are achieved and are in compliance with life and safety standards. Provide Master Key control services. Provide and implement a sound furnishings and appliances program that addresses acquisition, replacement, M&R, and refurbishing. Provide Hospitality Kits consisting of the minimum essential items to operate a household until permanent party personnel's HHG arrive and from HHG shipment until departure. Provide COOM on all facilities prior to reassignment to in-coming resident.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Programmatic Economic Increase</p> <p>Title: Law Enforcement</p> <p>Description: Provides Law Enforcement (LE) activities/services for the protection of people and property, enforcement of laws, and maintenance of order. This effort covers, but is not limited to: all personnel and operating costs associated with LE operations, salaries, overtime, benefits, material and supplies, equipment, vehicles, training and management for LE response forces (Department of the Army Civilian Police (DACP) and military police (MP)). Funds the conduct of motor vehicle traffic supervision, and liaison with civilian LE agencies. Funds LE work load derived from historical responses to calls for service (i.e. Crimes against Persons, Drug Crimes, Traffic Crimes, Absent Without Leave (AWOL), Sex Crimes, and Crimes against Property, Environmental Violations, Fraud Crimes, Alarm Response and Public Service Calls), investigation of non-felony level offenses, preparation and distribution of MP reports and related documents, and collection and analyses of crime statistics.</p> <p>FY 2020 Plans: Continue to provide LE activities/services for the protection of people and property, enforcement of laws, and maintenance of order. Will cover, but not limited to, all personnel and operating costs associated with LE operations, salaries, overtime, benefits, material and supplies, equipment, vehicles, training and management for LE response forces.</p> <p>FY 2021 Plans:</p>	0.929	1.537	1.631

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Continue to provide LE activities/services for the protection of people and property, enforcement of laws, and maintenance of order. Will cover, but not limited to, all personnel and operating costs associated with LE operations, salaries, overtime, benefits, material and supplies, equipment, vehicles, training and management for LE response forces.			
FY 2020 to FY 2021 Increase/Decrease Statement: Programmatic Economic Increase			
Title: Materiel Maintenance Description: Provide for automotive, Marine vessel, Construction, General Equipment, and Armament Maintenance. Also provides Field and Sustainment level maintenance services to Army activities in accordance with AR 750-1; provides maintenance technical assistance to supported units and activities, and provides material maintenance on base operations support equipment.	6.161	15.761	2.920
FY 2020 Plans: Continue to provide resources for the maintenance of all 6 aircraft, 17 marine vessels, heavy equipment, non-tactical and tactical equipment, construction equipment; base operations equipment and marine navigational aides. Provide government estimates for repair/ replacement of damaged, lost or lifecycle replacement equipment. Provide resources for On-Condition Cyclic Maintenance (OCCM) for marine vessels.			
FY 2021 Plans: Continue to provide resources for the maintenance of all 6 aircraft, 17 marine vessels, heavy equipment, non-tactical and tactical equipment, construction equipment; base operations equipment and marine navigational aides. Provide government estimates for repair/ replacement of damaged, lost or lifecycle replacement equipment. Provide resources for On-Condition Cyclic Maintenance (OCCM) for marine vessels.			
FY 2020 to FY 2021 Increase/Decrease Statement: Realigned resources to align with expected contract execution (see Municipal Services, Installation Command and Management, Supply Logistics and Transportation Services) as well as revert to routine vs scheduled maintenance/overhaul			
Title: Municipal Services Description: Provides for municipal services including grounds maintenance, custodial, pest management, solid waste or refuse handling operations, pavement clearance.	3.959	1.865	1.932
FY 2020 Plans: Will provide necessary/routine municipal services to the Installation.			
FY 2021 Plans:			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
Will provide necessary/routine municipal services to the Installation.				
FY 2020 to FY 2021 Increase/Decrease Statement: Programmatic Economic Increase				
Title: Installation Command and Management		31.284	23.842	33.813
Description: Provides for a K-12 school system, medical/dental services, and Base Support Contract overhead fees. Additionally, supports offices of the Commander, Staff Judge Advocate (SJA), Chaplain, Public Affairs (PA), and Safety Office. Supports civilian pay and benefits, training, duty travel, Permanent Change of Station (PCS) costs, equipment, and contractual services for installation command and management activities. Kwajalein Medical/Dental services provide family practice and emergency services at Kwajalein (2-5 days for MEDEVAC support to Honolulu), a secondary clinic on Roi-Namur, and a dental clinic. Support includes but is not limited to medical lab and imaging services, pharmacy services, basic dental services, and all medical functions including inspections of medical facilities.				
FY 2020 Plans: Provide Installation Command and Management across 11 islands/defense sites to a population of over 100 Active Duty Military and Department of the Army civilians & 1100 contractors and their family members. Plan, organize, staff, direct, and control all aspects of installation and command management.				
FY 2021 Plans: Provide Installation Command and Management across 11 islands/defense sites to a population of over 100 Active Duty Military and Department of the Army civilians & 1100 contractors and their family members. Plan, organize, staff, direct, and control all aspects of installation and command management.				
FY 2020 to FY 2021 Increase/Decrease Statement: Realigned resources to align with expected contract execution (see Municipal Services, Installation Command and Management, Supply Logistics and Transportation Services)				
Title: Personnel Services Delivery		-	0.117	0.121
Description: Provides a human resource specialist responsible for providing all aspects of human resource management, administrative, and counsel to the Garrison Staff.				
FY 2020 Plans: Continue to provide human resource support to the Garrison Staff.				
FY 2021 Plans:				

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B. Accomplishments/Planned Programs (\$ in Millions) Continue to provide human resource support to the Garrison Staff. FY 2020 to FY 2021 Increase/Decrease Statement: Programmatic Economic Increase			FY 2019	FY 2020	FY 2021
Title: Physical Security Matters	Description: Provides resources for physical security programs and equipment to support Army installations and facilities requirements. Procures, installs, maintains and/or leases physical security equipment to include, but not limited to barriers; blast mitigation devices; communication systems; explosive detection devices; intrusion detection systems and devices; sensors; site improvements; management/planning; and security forces and technicians. Funds contract security guards including military working dog management and equipping the installation with explosive and drug detection dog capabilities.		4.902	5.500	5.669
FY 2020 Plans: Continue to provide the necessary physical security procedures and materials to ensure USAG-KA maintains all proper security measures.					
FY 2021 Plans: Continue to provide the necessary physical security procedures and materials to ensure USAG-KA maintains all proper security measures.					
FY 2020 to FY 2021 Increase/Decrease Statement: Programmatic Economic Increases					
Title: Army Security Programs	Description: Funds Army Command security activities supporting: Information Security, Personnel Security, Industrial Security, Communications Security (COMSEC) Policy, Security Education, Training and Awareness (SETA), Special Access Program (SAP) Security, Sensitive Compartmented Information (SCI) Security, Foreign Disclosure, and Technology Protection.		0.150	0.119	0.122
FY 2020 Plans: Continue to provide the necessary security procedures and materials to ensure USAGKA maintains all proper security measures to ensure successful missions continue on USAGKA.					
FY 2021 Plans: Continue to provide the necessary security procedures and materials to ensure USAGKA maintains all proper security measures to ensure successful missions continue on USAGKA.					
FY 2020 to FY 2021 Increase/Decrease Statement:					

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2040 / 6	PE 0605301A / Army Kwajalein Atoll	DW8 / Army Kwajalein Atoll Installation Services	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020
Programmatic Economic Increases			
Title: Supply Logistics		29.730	3.134
Description: Provides supply operations which support: ammunition supply point services, bulk petroleum operations, marine and aviation assets, Army tenants, operation of a central receiving point and/or Installation Supply Support Activity (SSA) for goods delivered to the installation, management of non-deployable installation property, and receipt, storage, issue, reutilization and tracking of hazardous materials.			24.195
FY 2020 Plans: Continue to provided resources for property accountability of all GFE/CAP, reutilization items, Military Standard Requisitioning and Use Procedures ordering and delivery to multiple outer islands. Dispose of obsolete items in accordance with Army equipment disposition procedures.			
FY 2021 Plans: Continue to provided resources for property accountability of all GFE/CAP, reutilization items, Military Standard Requisitioning and Use Procedures ordering and delivery to multiple outer islands. Dispose of obsolete items in accordance with Army equipment disposition procedures.			
FY 2020 to FY 2021 Increase/Decrease Statement: Realigned resources to align with expected contract execution (see Municipal Services, Installation Command and Management, Supply Logistics and Transportation Services)			
Title: Transportation Services		15.492	23.925
Description: Provides the operation of installation transportation offices, transportation motor pools, and cost of rolling stock; also includes movement of privately-owned household goods of military personnel (and civilian personnel in overseas areas) in connection with assignment, reassignment, or termination of government-furnished family housing.			3.015
FY 2020 Plans: Continue to provide resources for the operation of all transportation services to include 6 aircraft, 17 marine vessels, and over 200 pieces of rolling stock. Operate a centralized motor pool. Fund operations for movement of all international and intra atoll air and surface cargo to include mission critical equipment and supplies, household goods, HAZMAT, United States Postal Service (USPS) mail, medical, and food items. Safely ferry over 48,000 mission critical employees per month within the atoll on various USAGKA marine assets.			
FY 2021 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 6	PE 0605301A / Army Kwajalein Atoll	DW8 / Army Kwajalein Atoll Installation Services	
B. Accomplishments/Planned Programs (\$ in Millions)			
Continue to provide resources for the operation of all transportation services to include 6 aircraft, 17 marine vessels, and over 200 pieces of rolling stock. Operate a centralized motor pool. Fund operations for movement of all international and intra atoll air and surface cargo to include mission critical equipment and supplies, household goods, HAZMAT, United States Postal Service (USPS) mail, medical, and food items. Safely ferry over 48,000 mission critical employees per month within the atoll on various USAGKA marine assets.			
FY 2020 to FY 2021 Increase/Decrease Statement: Realigned resources to align with expected contract execution (see Municipal Services, Installation Command and Management, Supply Logistics and Transportation Services)			
Title: Utilities Description: Provides utility services - production and distribution of utilities including expenses for electricity, steam, hot water, fuels and other utilities, and operation of electrical, air conditioning, refrigeration, water distribution, and wastewater collection and treatment plants and systems. FY 2020 Plans: Continue to provide resources including fuel to operate and maintain seven Power generation and distribution systems on Kwajalein; nine on Roi, five on Meck, and eleven total on the outer islands of Carlos, Gagan, Illeginni, and Legan, distributing over 7.5 Million kilowatt hours / month. Operate, maintain, and repair all prime power plants, distribution systems, and ancillary equipment and related systems, including fixed and portable auxiliary generators. Provide reliable power during mission windows. Develop and implement a maintenance plan which includes operator maintenance, predictive maintenance, Program Management (PM), cyclical, and recurring maintenance, as well as periodic equipment and systems overhauls for all power production systems. Provide appropriate staff to operate power plants 24 hours a day. Operate and maintain potable and non-potable water production & distribution systems. Operate and maintain wastewater treatment plant water systems and storage including equipment. Distribute water to a population of approximately 1400 people consuming over 5.3 million gallons of water per month. Operate all wastewater treatment plants and equipment, collection and distribution systems, and all ancillary equipment and other related systems, including septic tanks. Develop, implement, and manage a waste management program including collection, incineration, landfill, compost, and recycling facilities. Provide preventative, cyclical and recurring, and unscheduled maintenance and repair of the Incinerator and all ancillary equipment and systems. FY 2021 Plans: Continue to provide resources including fuel to operate and maintain seven Power generation and distribution systems on Kwajalein; nine on Roi, five on Meck, and eleven total on the outer islands of Carlos, Gagan, Illeginni, and Legan, distributing over 7.5 Million kilowatt hours / month. Operate, maintain, and repair all prime power plants, distribution systems, and ancillary equipment and related systems, including fixed and portable auxiliary generators. Provide reliable power during mission	9.940	17.902	18.534

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 6	PE 0605301A / Army Kwajalein Atoll	DW8 / Army Kwajalein Atoll Installation Services	
B. Accomplishments/Planned Programs (\$ in Millions)			
windows. Develop and implement a maintenance plan which includes operator maintenance, predictive maintenance, Program Management (PM), cyclical, and recurring maintenance, as well as periodic equipment and systems overhauls for all power production systems. Provide appropriate staff to operate power plants 24 hours a day. Operate and maintain potable and non-potable water production & distribution systems. Operate and maintain wastewater treatment plant water systems and storage including equipment. Distribute water to a population of approximately 1400 people consuming over 5.3 million gallons of water per month. Operate all wastewater treatment plants and equipment, collection and distribution systems, and all ancillary equipment and other related systems, including septic tanks. Develop, implement, and manage a waste management program including collection, incineration, landfill, compost, and recycling facilities. Provide preventative, cyclical and recurring, and unscheduled maintenance and repair of the Incinerator and all ancillary equipment and systems.	FY 2019	FY 2020	FY 2021
FY 2020 to FY 2021 Increase/Decrease Statement: Programmatic Economic Increases			
Title: Environmental Quality Description: Provides manpower and funding necessary to achieve, evaluate, and sustain compliance with appropriate Compact of Free Association, national, and USAKA Environmental Standards, Executive Orders, DoD Directives, regulations, and overseas country-specific. Final Governing Standards, in order to protect human health and safety and reduce total cost to the Army through environmental compliance, conservation, and pollution prevention. Enables installations to comply with legal environmental mandates and critical stewardship responsibilities that impact management and modernization of installations, while sustaining natural and cultural resources in a manner that provides continued access and long-term use of training lands to support the Army's installation missions. Also includes costs associated with Range Military Construction (MILCON) to address one-time mitigation actions.	1.388	2.077	2.149
FY 2020 Plans: Will provide necessary/routine environmental quality services to the Installation.			
FY 2021 Plans: Will provide necessary/routine environmental quality services to the Installation.			
FY 2020 to FY 2021 Increase/Decrease Statement: Programmatic Economic Increases			
Title: Anti-Terrorism (AT) Description: Funds the Army Antiterrorism program, a defensive program to protect against Terrorism. Supports the following: Antiterrorism installation and mission requirements: Combatant Commands (COCOM) Antiterrorism requirements (Army as Executive Agent (EA)), Antiterrorism Program Management, Antiterrorism Training and Awareness efforts (Area of Responsibility	-	0.210	0.217

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 6	PE 0605301A / Army Kwajalein Atoll	DW8 / Army Kwajalein Atoll Installation Services	
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
(AOR) specific, Level I Antiterrorism Awareness Training, Level II Antiterrorism Officers Training, Level III Pre-command training, and Level IV Antiterrorism Executive Seminar), protection of High Risk Personnel (HRP) to include support requirements (equipment), execution of Antiterrorism Assessments (Terrorism Vulnerability Assessments, Special Event Assessments, Pre-deployment Vulnerability Assessments, and Comprehensive Antiterrorism Reviews) designed to identify and fix protection vulnerabilities that will protect personnel and facilities from terrorist acts, intelligence support to Army Antiterrorism, conduct annual Antiterrorism Exercises designed to execute Antiterrorism plans, and the implementation of the Random Antiterrorism Measures Program (RAMP) and the Force Protection Condition (FPCON) system.			
FY 2020 Plans:			
Will provide antiterrorism programs. Will provide personnel with the necessary training and identify high risk individuals when appropriate. Will continue to identify and update vulnerabilities to our facilities and put protective measures in place to reduce risks to mission.			
FY 2021 Plans:			
Will provide antiterrorism programs. Will provide personnel with the necessary training and identify high risk individuals when appropriate. Will continue to identify and update vulnerabilities to our facilities and put protective measures in place to reduce risks to mission.			
FY 2020 to FY 2021 Increase/Decrease Statement:			
Programmatic Economic Increases	Accomplishments/Planned Programs Subtotals	138.419	124.738
123.923			
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)					Project (Number/Name)			
2040 / 6					PE 0605301A / Army Kwajalein Atoll					DW9 / Army Kwajalein Atoll Restoration And Modernization			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
DW9: Army Kwajalein Atoll Restoration And Modernization	-	68.513	57.887	49.312	-	49.312	46.995	47.923	48.402	48.407	0.000	367.439	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds the restoration and modernization of United States (U.S.) Army Kwajalein Atoll (USAKA) degraded infrastructure (Real Property/facilities) to working condition and upgrades facilities to meet current standards. Restoration consists of repair and replacement work to fix facilities degraded due to the effects of aging and previously deferred sustainment. Modernization supports upgrade of facilities to meet current codes, accommodate new functions, and/or replace building components that exceed the overall service life of the facilities.

Fiscal Year (FY) 2020 funds will continue to provide resources in support of a Headquarters, Department of the Army (HQDA)-approved 15-year investment plan. Funds focus on Phase II of the Bucholz Army Airfield runway repair. Efforts will include repairing 1000 feet on both ends of the runway down to subgrade, resurfacing the center section of runway, and repairing aged and deteriorating airfield pavements to include airfield lighting and back up generator.

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

	FY 2019	FY 2020	FY 2021
Title: Recapitalization Deficit R&M	68.513	57.887	49.312
Description: Provides facility restoration for facilities not specifically aligned to specified Facility Investment Strategy focus areas. Funds facilities quality improvement required to achieve elimination of Q4/Q3 Installation Status Report (ISR) rated facilities. In addition to major renovation costs, facility costs include project tails in accordance with AR 420-1 for: National Environmental Policy Act (NEPA) compliance.			
FY 2020 Plans: Will continue to provide (3rd year) resources against the HQDA-approved 15-year investment plan, focusing on completion of Phase II of the Bucholz Army Airfield runway, including repair of 1000 feet on both ends of the runway down to subgrade, resurfacing center section of runway, and repairing aged and deteriorating airfield pavements to include airfield lighting and back up generator.			
FY 2021 Plans: Will continue to provide resources against the HQDA-approved 15-year investment plan, focusing on completion of Phase II of the Bucholz Army Airfield runway, including repair of 1000 feet on both ends of the runway down to subgrade, resurfacing center section of runway, and repairing aged and deteriorating airfield pavements to include airfield lighting and back up generator.			
FY 2020 to FY 2021 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605301A / Army Kwajalein Atoll	Project (Number/Name) DW9 / Army Kwajalein Atoll Restoration And Modernization
B. Accomplishments/Planned Programs (\$ in Millions) Decrease represents programmed decrease in 15 year airfield investment plan begun in FY18. First 3 years (FY18-20) required a higher initial investment than 21+ steady state for remainder of plan.		FY 2019
		FY 2020
		FY 2021
		Accomplishments/Planned Programs Subtotals
		68.513
		57.887
		49.312
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 6					PE 0605301A / Army Kwajalein Atoll				DX2 / Army Kwajalein Test Ranges and Mission Support				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
DX2: Army Kwajalein Test Ranges and Mission Support	-	10.282	10.811	11.519	-	11.519	11.674	11.702	11.826	11.948	0.000	79.762	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification												
This Project funds Network Enterprise Technology Command (NETCOM) installation management-related Command, Control, Communications, Computers, and Information Management (C4IM) services at Army Kwajalein Test Ranges. NETCOM utilizes this Project to provide civilian pay, manpower service contracts, supporting Information technology (IT) equipment, and associated costs specifically identified and measurable to plan, manage, coordinate, and execute Information Technology Services Management at Army Kwajalein Test Ranges. Project provides C4IM services in accordance with the Department of Army Pamphlet (DA PAM) PAM 25-1-1 and the Army C4IM Services List. Provides Base Communications Support (Service 701), Visual Information (Service 702), Information Assurance (Service 703), and Automation (Service 700). Includes the delivery of services consisting of secure and non-secure fixed voice communications, wireless voice, data and video connectivity services, and studio video conferencing services. Provides infrastructure support, including the design, installation, and maintenance of special circuits/systems in support of life safety/security systems and monitoring/control systems. Provides Collaboration and Messaging Services including services and tools for workforce to communicate and share information. Provides Application and Web-hosting including operation and management services required to support web and application hosting. Provides Desktop Management Support including management and support for end-user hardware and software services and tools. Includes Service Desk Support, Continuity of Operations, and Disaster Recovery support.												

B. Accomplishments/Planned Programs (\$ in Millions)												FY 2019	FY 2020	FY 2021
Title: Contractor Support (C4IM Services)												8.609	9.092	9.791
Description: The Contractor shall provide non-personnel IT support to the 30th Signal Battalion NEC on Kwajalein Atoll. The NEC's IT environment includes any hardware, software, application, tool, system, or network used by the Government, whether developed, leased, or commercially purchased. Although this is a level of effort service contract, there are currently 74 contractors supporting this capability at Kwajalein. The contract covers supply and small equipment replacement that are needed to perform C4IM services.														

FY 2020 Plans:														
Work will include current and new systems at various lifecycle stages, and any future applications and systems not currently identified in this PWS. The 30th Signal Battalion NEC requires support for unclassified and classified networked systems located throughout Kwajalein Atoll, including the islands of Kwajalein, Roi-Namur, Gagan, Omleck, Meck, Carlos, Legan, and Illeginni. Currently, the 30th Signal Battalion NEC supports approximately 2,000 users, computers, and notebooks with about 20 servers, both physical and virtual.														

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605301A / Army Kwajalein Atoll	Project (Number/Name) DX2 / Army Kwajalein Test Ranges and Mission Support	
B. Accomplishments/Planned Programs (\$ in Millions)			
<p>Provide Command, C4IM services in accordance with the DA PAM 25-1-1 and the Army C4IM Services List. Provide Base Communications Support (Service 701), Visual Information (Service 702), Information Assurance (Service 703), and Automation (Service 700). Delivery services consisting of secure and non-secure fixed voice communications, wireless voice, data and video connectivity services, and studio video conferencing services. Provide infrastructure support, including the design, installation, and maintenance of special circuits/systems in support of life safety/security systems and monitoring/control systems. Provide Collaboration and Messaging Services including services and tools for workforce to communicate and share information. Provide Application and Web-hosting including operation and management services required to support web and application hosting. Provide Desktop Management Support including management and support for end-user hardware and software services and tools, to include Service Desk Support, Continuity of Operations, and Disaster Recovery support.</p> <p>FY 2021 Plans: Work shall include current and new systems at various lifecycle stages, and any future applications and systems not currently identified in this PWS. The 30th Signal Battalion NEC requires support for unclassified and classified networked systems located throughout Kwajalein Atoll, including the islands of Kwajalein, Roi-Namur, Gagan, Omleck, Meck, Carlos, Legan, and Illeginni. Currently, the 30th Signal Battalion NEC supports approximately 2,000 users, computers, and notebooks with about 20 servers, both physical and virtual.</p> <p>Provide Command, C4IM services in accordance with the DA PAM 25-1-1 and the Army C4IM Services List. Provide Base Communications Support (Service 701), Visual Information (Service 702), Information Assurance (Service 703), and Automation (Service 700). Delivery services consisting of secure and non-secure fixed voice communications, wireless voice, data and video connectivity services, and studio video conferencing services. Provide infrastructure support, including the design, installation, and maintenance of special circuits/systems in support of life safety/security systems and monitoring/control systems. Provide Collaboration and Messaging Services including services and tools for workforce to communicate and share information. Provide Application and Web-hosting including operation and management services required to support web and application hosting. Provide Desktop Management Support including management and support for end-user hardware and software services and tools, to include Service Desk Support, Continuity of Operations, and Disaster Recovery support.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Economic adjustments for expected inflation rate. Civilian pay rate adjustments.</p>	FY 2019	FY 2020	FY 2021
Title: Civilian Pay	0.233	0.279	0.288
Description: Civilian Pay			
FY 2020 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605301A / Army Kwajalein Atoll	Project (Number/Name) DX2 / Army Kwajalein Test Ranges and Mission Support	
B. Accomplishments/Planned Programs (\$ in Millions)			
The 2 civilians do a multitude of things from Site manager, COR, manages and performs Enterprise Information Technology (IT) Customer Services. Coordinates all aspects of effective Service Desk, Break Fix, Network Management, Systems Administration and Engineering, Project Management, Software Engineering, Video Teleconferencing, Information Management Officer (IMO) Support, Information Assurance, Telecommunications, and IT Logistics. Also responsible for incident management, problem management, availability management, configuration management, and change management. The positions are responsible for all inherently government functions.	FY 2019	FY 2020	FY 2021
FY 2021 Plans: The two civilians will continue to perform duties such as Site manager, COR, manages and performs Enterprise Information Technology (IT) Customer Services. Coordinates all aspects of effective Service Desk, Break Fix, Network Management, Systems Administration and Engineering, Project Management, Software Engineering, Video Teleconferencing, Information Management Officer (IMO) Support, Information Assurance, Telecommunications, and IT Logistics. Also responsible for incident management, problem management, availability management, configuration management, and change management. The positions are responsible for all inherently government functions.			
FY 2020 to FY 2021 Increase/Decrease Statement: Breaking out the original total to show the details of the \$11.5M. The only increase would be due to the CEAC rate.			
Title: ISSA (Installation Service Support Agreement) Description: ISSA with Garrison to provide all services that would normally be provided by the home station and other services specific to Kwajalein.	1.440	1.440	1.440
FY 2020 Plans: Pay Garrison to provide housing, food support, etc.			
FY 2021 Plans: Pay Garrison to provide housing, food support, etc.			
Accomplishments/Planned Programs Subtotals			10.282 10.811 11.519
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0605326A / Concepts Experimentation Program							
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	30.667	36.922	54.898	-	54.898	59.199	59.858	60.609	61.684	0.000	363.837
312: Army/Joint Experimentation	-	5.786	7.725	11.958	-	11.958	15.614	12.857	13.109	13.201	0.000	80.250
317: Current Force Capability Gaps	-	23.229	29.046	42.940	-	42.940	43.585	47.001	47.500	48.483	0.000	281.784
33B: Soldier-Centered Analyses For Future Force	-	1.652	0.151	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.803

A. Mission Description and Budget Item Justification

The Army Concepts Experimentation Program supports current and future concepts and capabilities involving Soldiers and Leaders within live, virtual, and constructive environments by exploring concepts, capability requirements and solutions across Doctrine, Organization, Training, Materiel, Leadership and Education, personnel, and Facilities (DOTMLPF) domains. The purpose of Concepts Experimentation is to clarify and mitigate risk for current and future forces. Experiments and projects inform Army futures concepts and assess high-risk conceptual assumptions in order to focus required capabilities and represent user requirements in the future Army. Army experiments use the combined resources of Army Battle Laboratories, operational units, research labs, materiel developers, industry and academia to collaborate in the development, refinement, and assessment of future force concepts. Simulated Experiments (SIMEX) will integrate and assess Army Concepts and Force Design phases with Army-level issues across the breadth of a campaign that highlights validation and integration of Force 2025 outcomes.

This Program Element (PE) enhances Joint Capabilities Integration and Development System (JCIDS) development in support of Program Executive Offices (PEOs) and Program Managers (PMs) for acquisition milestone decisions. This PE provides for Accelerated Capability Development (ACD) to address current critical operational needs, enabling development and deployment/employment of accelerated capabilities (both materiel and non-materiel) to the current force. Early Synthetic Prototyping enables a wargaming and experimentation capability that engages soldiers across the Army through early-fidelity game environments to gain their insights and recommendations in the development of future doctrine, organization, and materiel solutions. This PE provides funding for Army Warfighter Assessments (AWA) that physically integrate, assess and evaluate networked capability sets and other adaptive capabilities to accelerate the systems acquisition process of providing DOTMLPF recommendations to the Army. This PE also provides support to the Army Warfighting Challenges (AWFC) used by the Army to frame learning and collaboration.

The Soldier-Centered Analysis For Future Force Project (33B) will provide early application of human performance and human figure modeling tools in the development of Soldier-focused requirements to shape technology for Future Force development. These efforts include design analyses, constructive simulations, and Soldier-in-the-loop assessments to ensure that manpower requirements and workload and skill demands are considered, avoiding information and physical task overloads and taking optimum advantage of aptitudes, individual and collective training, and numbers of Soldiers for an affordable Future Force.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army					Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name) PE 0605326A / Concepts Experimentation Program				
B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	30.394	42.922	43.136	-	43.136
Current President's Budget	30.667	36.922	54.898	-	54.898
Total Adjustments	0.273	-6.000	11.762	-	11.762
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-6.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	1.326	-			
• SBIR/STTR Transfer	-1.053	-			
• Adjustments to Budget Years	-	-	11.762	-	11.762

Change Summary Explanation

Fiscal Year 2020 (FY20) reduction related to congressional reduction for excess growth.

FY21 increase related to additional Capability Development Integration Directorate (CDID) cyber requirements, Future Concept Center (FCC) requirements, and Army Capability-based Architecture Development and Integration Environment (ArCADIE) maintenance requirements in Project 317.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605326A / Concepts Experimentation Program				Project (Number/Name) 312 / Army/Joint Experimentation				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
312: Army/Joint Experimentation	-	5.786	7.725	11.958	-	11.958	15.614	12.857	13.109	13.201	0.000	80.250	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification													
Army and Joint Experimentation supports current and future concepts and capabilities involving Soldiers and Leaders within live, virtual, and constructive environments by exploring concepts, capability requirements, and solutions across Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, and Facilities (DOTMLPF) domains. The purpose of these efforts is to learn and mitigate risk for current and future forces. Experiments inform Army future concepts and assess high-risk conceptual assumptions in order to focus required capabilities and represent user requirements in the future Army. Army experiments use the combined resources of Army Battle Laboratories, operating force units, research laboratories, materiel developers, industry, and academia to collaborate in the development, refinement, and assessment of future force concepts. These experiments refine and validate concepts for current and future forces to inform capability developments and requirements determination. Since Fiscal Year (FY) 2015, this Project has supported the Army's Simulation-Based Experiments (SIMEXp) to integrate and assess near-, mid-, and far-term future force concepts, force designs, and capabilities. In support of the Army Vision and Army Strategy, experimentation focuses on the latest Multi-Domain Operations Concept and operational and organizational concepts for the Army of 2028 and beyond. To refine the Multi-Domain Operations Concepts, Army experimentation expands linkages to multi-Service and Joint experiments.													
B. Accomplishments/Planned Programs (\$ in Millions)											FY 2019	FY 2020	FY 2021
Title: Experimentation - High-Fidelity Live-Virtual-Constructive Experiments											5.786	7.374	11.958
Description: Experiments address concept and capability developments including integration of capabilities for all Brigade Combat Team (BCT) types; development of future DOTMLPF requirements and solutions; and acceleration and integration of capabilities for current force BCTs and above brigade.													
FY 2020 Plans: Will conduct experiments to address concept and capability developments including integration of capabilities for all BCT types. Will develop future DOTMLPF requirements and solutions and accelerate / integrate capabilities for current force BCTs and above brigade.													
FY 2021 Plans: Experiments will address concept and capability developments including integration of capabilities for all BCT types; development of future DOTMLPF requirements and solutions; and acceleration and integration of capabilities for current force BCTs and above brigade.													
FY 2020 to FY 2021 Increase/Decrease Statement:													

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605326A / Concepts Experimentation Program	Project (Number/Name) 312 / Army/Joint Experimentation	
B. Accomplishments/Planned Programs (\$ in Millions) Mission increase in experimentation costs for concepts and capabilities developments.			FY 2019 FY 2020 FY 2021
Title: FY 2020 SBIR/STTR Transfer		-	0.351
Description: Funding transferred in accordance with Title 15 USC 638			-
FY 2020 Plans: Funding transferred in accordance with Title 15 USC 638			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638			
Accomplishments/Planned Programs Subtotals			5.786 7.725 11.958
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)			
2040 / 6					PE 0605326A / Concepts Experimentation Program				317 / Current Force Capability Gaps			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
317: Current Force Capability Gaps	-	23.229	29.046	42.940	-	42.940	43.585	47.001	47.500	48.483	0.000	281.784
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project enables Army Capability Development and Integration Programs to support the Joint Capabilities Integration and Development System (JCIDS). These efforts involve integrating Program Executive Offices (PEOs) and Program Managers (PMs) to ensure coordinated and integrated acquisition Milestone decisions in a timely manner. Funding in this Project ensures that the Army Futures Command (AFC) / Future Concepts Center (FCC) acts independently and serves as the voice of the warfighter, complementing the materiel developer in providing total capability management that integrates all doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF) considerations. These resource requirements provide AFC and FCC resources to execute as lead for Accelerated Capability Development (ACD) and central coordination for Headquarters, Department of the Army (HQDA). These requirements support critical research, development, test and evaluation for Early Synthetic Prototyping and enable war-gaming and experimentation that engages soldiers across the Army to gain insights and recommendations in the development of future doctrine, organization, and materiel solutions. FCC integrates accelerated capabilities development activities between Army proponent force modernization managers as well as Joint / Sister Service coordination. AFC/FCC conducts Joint Warfighter Assessments to physically integrate, assess and evaluate adaptive capability sets to accelerate the systems acquisition process that provides DOTMLPF recommendations to the Army.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Title: Joint Warfighting Assessments	2.118	3.007	6.330
FY 2020 Plans: Support Joint Expeditionary Maneuver and Entry Operations, Set the Theater, Special Operations Forces/Coalition Forces Interoperability, Air-Ground Reconnaissance and Security, Joint Multinational Operations, Sea Basing/Joint Logistics Over the Shore (JLOTS), Mobile Command Posts (Expeditionary), Man Unmanned Teaming, (Ground/Air) (MUM-T), Accelerated Capabilities Developments, Early Synthetic Prototyping and Architecture Joint Warfighting Assessments (JWA).			
FY 2021 Plans: Provide for AFC/FCC to serve as the lead Accelerated Capability Development to address current critical operational needs in enabling development and deployment of accelerated capabilities (both materiel and non-materiel) to the current force. Serve as AFC/FCC central coordinating organization for Headquarters Department of the Army HQDA staff support requirements related to accelerated capabilities developments. Integrate JMC activities to ensure unity and priority of effort and synchronization and optimization of resources. Integrate accelerated capabilities development activities between proponent force modernization domains to include Joint Service coordination.			
FY 2020 to FY 2021 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 6	PE 0605326A / Concepts Experimentation Program	317 / Current Force Capability Gaps	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020
Mission increase of accelerated capabilities developments which are being realized in transition from ARCIC to FCC.			
Title: Accelerated Capabilites Development		1.544	2.102
FY 2020 Plans: Provide for AFC/FCC to serve as the lead ACD to address current critical operational needs in enabling development and deployment of accelerated capabilities (both materiel and non-materiel) to the current force. Serve as AFC/ARCIC central coordinating organization for Headquarters Department of the Army HQDA staff support requirements related to accelerated capabilities developments. Integrate ACD activities to ensure unity and priority of effort and synchronization and optimization of resources. Integrate accelerated capabilities development activities between proponent force modernization.		3.904	
FY 2021 Plans: Provide for AFC/FCC to serve as the lead Accelerated Capability Development to address current critical operational needs in enabling development and deployment of accelerated capabilities (both materiel and non-materiel) to the current force. Serve as AFC/FCC central coordinating organization for Headquarters Department of the Army HQDA staff support requirements related to accelerated capabilities developments. Integrate JMC activities to ensure unity and priority of effort and synchronization and optimization of resources. Integrate accelerated capabilities development activities between proponent force modernization domains to include Joint Service coordination.			
FY 2020 to FY 2021 Increase/Decrease Statement:			
Mission increase of accelerated capabilities developments which are being realized in transition from ARCIC to FCC.			
Title: CDID/TCM JCIDS Requirements Documentation		17.523	19.727
Description: In Fiscal Year 2014 the TRADOC Capability Development Integration Directorate (CDID) Capability Manager began finalizing a transfer of JCIDS Requirements Documentation Mission responsibility from the Assistant Secretary of the Army for Acquisition, Logistics, and Technology. This activity provides essential Joint Capabilities Integration and Development System Requirements Documentation.		27.365	
FY 2020 Plans: Funding ensures AFC/FCC acts independently as the voice of the warfighter, the user, in complement with the materiel developer in providing total capability management including integration of all DOTMLPF considerations for warfighting functional areas.			
FY 2021 Plans: This project enables FCC in support of the AFC Commander to enhance processes to improve the JCIDS. It integrates the PEOs and PMs ensuring a coordinated and integrated acquisition milestone decisions met in a timely manner within the Future Force Modernization Enterprise (FFME). The AFC team facilitates requirements determination in coordination with the Joint Requirements Oversight Council (JROC) and in coordination with the Assistant Secretary of the Army for Acquisition, Logistics,			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605326A / Concepts Experimentation Program	Project (Number/Name) 317 / Current Force Capability Gaps		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
<p>and Technology (ASA (ALT) which directs and ensures Milestone acquisition decisions are formally staffed and fully integrated across the FFME. Funding ensures AFC/FCC acts independently and serves as the voice of the warfighter, this effort complements the materiel developer in providing total capability management and ensures the integration of all DOTMLPF consideration. Funding ensures AFC/FCC acts independently and serves as the voice of the warfighter; this effort complements the materiel developer in providing total capability management and ensures the integration of all doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF) considerations. This requirement provides AFC and FCC the resources to support any accelerated capability development through use of existing Army Live Prototype Assessment (ALPA) venues. Enable development and deployment/employment of accelerated capabilities (both materiel and non-materiel) to the future force of 2028 and beyond. Serves as AFC's central coordinating organization for HQDA staff supporting requirements related to accelerated capabilities developments. Funding integrates ACD activities to ensure unity and priority of effort as well as synchronization and optimization of resources. Integrates accelerated capabilities development activities between proponent force modernization domains to include Joint/Service coordination. These requirements support critical research, development, test and evaluation for war gaming, and experimentation that engages soldiers across the Army. Enables the AFC/FCC leadership to gain insights and recommendations in the development of the future force in preparation for the CSA's Army of 2028. FCC Integrates accelerated capabilities development activities between Army proponent force, modernization managers, and Joint/Sister Service coordination. AFC/FCC JMC conducts Joint Warfighter Assessments and ALPA events to physically integrate, assess and evaluate the network, capability sets and other adaptive capabilities resulting in the acceleration of the systems acquisition process to providing DOTMLPF informed recommendations to the Army.</p>				
FY 2020 to FY 2021 Increase/Decrease Statement: Increased for additional CDID cyber requirements.				
Title: Army Capability-based Architecture Development and Integration Environment (ArCADIE) Description: ArCADIE is the Army's authoritative source for architecture data and supports the community of practice requirement. ArCADIE provides a robust collaborative and common enterprise environment for architecture-related efforts in support of critical institutional processes throughout the TRADOC Centers of Excellence and Army/Joint/Department of Defense (DOD) partners. Offers a single, federated web-based environment for the development and discovery of integrated architectures across warfighting functions, and organizations throughout the Army Enterprise.	2.044	2.891	5.341	
FY 2020 Plans: Enable the Army Capabilities Integration Center (ARCIC) to maintain ArCADIE and develop, verify, and validate operational architecture for eight major Brigade Combat Team (BCT) formations. Provide storage, accessibility, production, and certification of				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605326A / Concepts Experimentation Program	Project (Number/Name) 317 / Current Force Capability Gaps	
B. Accomplishments/Planned Programs (\$ in Millions) authoritative architecture data and supporting systems in accordance with DoD and DA information Assurance and management standards. FY 2021 Plans: Enable FCC to maintain ArCADIE and develop, verify, and validate operational architecture for eight major BCT formations. Provide storage, accessibility, production, and certification of authoritative architecture data and supporting systems in accordance with DoD and DA information Assurance and management standards. FY 2020 to FY 2021 Increase/Decrease Statement: ArCADIE maintenance increase.			FY 2019
Title: FY 2020 SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC 638		-	1.319
 FY 2020 Plans: Funding transferred in accordance with Title 15 USC 638 FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638			-
Accomplishments/Planned Programs Subtotals			23.229 29.046 42.940
C. Other Program Funding Summary (\$ in Millions) N/A Remarks			
D. Acquisition Strategy N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)			
2040 / 6					PE 0605326A / Concepts Experimentation Program				33B / Soldier-Centered Analyses For Future Force			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
33B: Soldier-Centered Analyses For Future Force	-	1.652	0.151	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.803
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	

Note

In Fiscal Year 2021 (FY21) this Project is being realigned to:

Program Element 0605604A Survivability Lethality Analysis

* Project 675 Army Survivability Analysis & Evaluation Supp

A. Mission Description and Budget Item Justification

This Project will provide early application of human performance and human figure modeling tools in the development of Soldier-focused requirements to shape technology for Future Force development. Efforts include design analyses, constructive simulations, and Soldier-in-the-loop assessments to ensure that manpower requirements and workload and skill demands are considered, avoiding information and physical task overloads and taking optimum advantage of aptitudes, individual and collective training, and numbers of Soldiers for an affordable Future Force.

The cited work is consistent with the Strategic Planning Guidance, the Army Science and Technology Master Plan (ASTMP), the Army Modernization Plan, and the Defense Technology Area Plan (DTAP).

Work in this Project is performed by the United States (U.S.) Army Combat Capabilities Development Command (CCDC) Data and Analysis Center (DAC).

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Title: Manpower and Personnel Integration (MANPRINT)	1.652	0.144	-
Description: Provide dedicated modeling and analysis cell for early and accurate MANPRINT estimates to the U.S. Army Materiel Command (AMC), CCDC and its Centers, the Research and Analysis Center, Schools and Centers of Excellence (CoEs), Army Test and Evaluation Command (ATEC) and other service laboratories.			
FY 2020 Plans: Will expand the digital library by developing 3-dimensional (3D) models of Soldier clothing and equipment items to perform early human figure modeling assessments of NGCV platform designs and enhancements.			
FY 2020 to FY 2021 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605326A / Concepts Experimentation Program	Project (Number/Name) 33B / Soldier-Centered Analyses For Future Force	
B. Accomplishments/Planned Programs (\$ in Millions) FY21 funds have been realigned into PE 0605604A Survivability/Lethality Analysis, Project 675, Army Survivability Analysis and Evaluation Support.		FY 2019	FY 2020
Title: FY 2020 SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC 638		-	0.007
FY 2020 Plans: Funding transferred in accordance with Title 15 USC 638			-
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638			
Accomplishments/Planned Programs Subtotals		1.652	0.151
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0605601A / Army Test Ranges and Facilities							
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	311.027	336.468	350.359	-	350.359	352.011	387.866	363.417	340.779	0.000	2,441.927
F30: Army Test Ranges & Facilities	-	311.027	336.468	350.359	-	350.359	352.011	387.866	363.417	340.779	0.000	2,441.927

A. Mission Description and Budget Item Justification

This Program Element (PE) provides the institutional funding required to operate test activities in accordance with Public Law 107-314 (National Defense Authorization Act for Fiscal Year 2003) Section 232 ("Objective for institutional funding of test and evaluation facilities") in support of Department of Defense (DoD) Program Executive Officers, Program and Product Managers, Research, Development, and Engineering Centers and to the Army Futures Command (AFC). Resources provided by this PE operate six elements of the DoD Major Range and Test Facility Base (MRTFB): White Sands Test Center (WSTC) - White Sands Missile Range (WSMR), New Mexico; Aberdeen Test Center (ATC) - Aberdeen Proving Ground (APG), Maryland; Electronic Proving Ground (EPG) - Fort Huachuca, Arizona; Yuma Test Center (YTC) - Yuma Proving Ground (YPG), Arizona; Cold Regions Test Center (CRTC) - Fort Greely, Alaska; and Tropic Regions Test Centers (TRTC) at various locations. This PE also funds the Army's test capability at Redstone Test Center (RTC) - Redstone Arsenal, Alabama.

This PE finances the overhead (institutional) test operating costs not billable to DoD test customers per DoD Instruction (DoDI) 3200.18 and DoD Financial Management Regulation (DoDFMR) 7000.14-R, which include: recurring test infrastructure/capability sustainment requirements; replacement of test equipment; test operating procedures; and test revitalization/upgrade projects to maintain \$8.7 Billion of testing capabilities; and improvements to the safety, environmental protection, and efficiency of test operations. The test capabilities at these ranges have been uniquely established, are in place to support test and evaluation (T&E) requirements of funded acquisition programs, and are required to assure technical performance, adherence to safety requirements, reliability, logistics supportability, Title 10 Live Fire Test and Evaluation, transportability, environmental effects, cyber, electromagnetic effects, and quality of materiel in development and in production.

This PE sustains the T&E capabilities required to support Army as well as Joint Service or Other Service systems, materiel, and technologies. Types of systems scheduled for testing include, but are not limited to: Aircraft, Air Delivery, Unmanned Aerial Systems, Counter Unmanned Aerial Systems, Unmanned Ground Vehicles, Air and Missile Defense Systems, Engineering Equipment, Direct fire, Indirect fire, Nonlethal weapons, Ammunition, Automotive Systems, Intelligence Surveillance and Reconnaissance, Ground Soldier Systems, Missiles, Rockets, Mission Command Network, Tactical Command, Control, and Communications, and Robotics/Unmanned Autonomous Systems. These T&E capabilities enable AFC modernization efforts and readiness.

Specific systems supported in Fiscal Year (FY) 2020 with continued support in FY 2021 include: 105-mm Mobile Wheeled Howitzer; 30mm/40mm ammunition; Active Protection System (APS); AH-64 Block III; AN/MPQ-64A3 Sentinel 3-D Radar; APR-39C(V)1 Radar; Armored Multi-Purpose Vehicle (AMPV); Army Integrated Air-Missile Defense (AIAMD); Army Tactical Missile System (ATACMS); CH-47F Chinook; Common Infrared Counter Measures (CIRCM); Common Robotic System-Individual (CRS-I); Counter Unmanned Aircraft System (c-UAS); Counter Rocket Artillery Mortar (C-RAM); Enhanced Heavy Equipment Transporter System (EHETS)/Medium Equipment Trailer (MET); Enhanced Night Vision Goggle - Binocular (ENVG-B); Expedient Leader Follower; Extended Range Cannon Artillery (ERCA); Family of Medium Tactical Vehicles (FMTV); Guided Multiple Launch Rocket System (GMLRS); Hypervelocity Gun Weapon System; Integrated Tactical Network (ITN), Javelin; Joint Air-to-Ground Missile (JAGM) for US Navy; Joint Light Tactical Vehicle (JLTV); Leader Radio; M109A7 Paladin/M992A3 Field Artillery Ammunition Supply Vehicle

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army		Date: February 2020			
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605601A / Army Test Ranges and Facilities				
(FAASV); M1147 Advanced Multi-Purpose X(AMP); M1A2 Abrams SEPv2 Next Evolution Armor (NEA); M-2/3 Bradley Expedited Active Protection System (ExAPS); M-2/3 Bradley Fist; M776 Chrome Tube; M777 Long Range Cannon; Maneuver Short Range Air Defense (M-SHORAD); Mobile Protected Firepower (MPF); Modular Handgun System (MHS); Optionally Manned Fighting Vehicle; Patriot 3 (PAC-3) Precision Guidance Kit (PGK); Precision Strike Missile (PrSM); Robotic Combat Vehicle (RCV); Shadow Tactical Unmanned Aircraft System (TUAS); Squat Multipurpose Equipment Transport (SMET); Stinger Shelf life Extension Program (SLEP); Stryker; Systems for Assured Position, Navigation and Timing (PNT); Terminal High-Altitude Area Defense (THAAD); and UH-60M Black Hawk.					
B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	315.634	334.468	341.811	-	341.811
Current President's Budget	311.027	336.468	350.359	-	350.359
Total Adjustments	-4.607	2.000	8.548	-	8.548
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	2.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-4.607	-			
• Adjustments to Budget Years	-	-	8.548	-	8.548
Congressional Add Details (\$ in Millions, and Includes General Reductions)					
Project: F30: Army Test Ranges & Facilities					
Congressional Add: <i>Cybersecurity Vulnerability and Assessment Test Environment (CVATE)</i>					
Congressional Add: <i>Soil Research for Army Training Ranges</i>					
			Congressional Add Subtotals for Project: F30		
			Congressional Add Totals for all Projects		
				FY 2019	FY 2020
				10.000	-
				-	2.000
				10.000	2.000
				10.000	2.000

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020					
Appropriation/Budget Activity					R-1 Program Element (Number/Name)					Project (Number/Name)						
2040 / 6					PE 0605601A / Army Test Ranges and Facilities					F30 / Army Test Ranges & Facilities						
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost				
F30: Army Test Ranges & Facilities	-	311.027	336.468	350.359	-	350.359	352.011	387.866	363.417	340.779	0.000	2,441.927				
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-				

A. Mission Description and Budget Item Justification

This Project provides the institutional funding required to operate test activities IAW Public Law 107-314 (National Defense Authorization Act for Fiscal Year 2003) Section 232 ("Objective for institutional funding of test and evaluation facilities") in support of DoD Program Executive Officers, Program and Product Managers, Research, Development, and Engineering Centers and to the AFC. Resources provided by this Project operate six elements of the DoD MRTFB: WSTC - WSMR, New Mexico; ATC - APG, Maryland; EPG - Fort Huachuca, Arizona; YTC - YPG, Arizona; CRTC - Fort Greely, Alaska; and TRTC at various locations. This Project also funds the Army's test capability at RTC - Redstone Arsenal, Alabama.

This Project finances the overhead (institutional) test operating costs not billable to DoD test customers per DoDI 3200.18 and DoDFMR 7000.14-R, which include: recurring test infrastructure/capability sustainment requirements; replacement of test equipment; test operating procedures; test revitalization/upgrade projects to maintain \$8.7 Billion of testing capabilities; and improvements to the safety, environmental protection, and efficiency of test operations. The test capabilities at these ranges have been uniquely established, are in place to support T&E requirements of funded acquisition programs, and are required to assure technical performance, adherence to safety requirements, reliability, logistics supportability, Title 10 Live Fire Test and Evaluation, transportability, environmental effects, cyber, electromagnetic effects, and quality of materiel in development and in production

This Project sustains the T&E capability required to support Army as well as Joint Service or Other Service systems, materiel, and technologies. Types of systems scheduled for testing include, but are not limited to: Aircraft, Air Delivery, Unmanned Aerial Systems, Counter Unmanned Aerial Systems, Unmanned Ground Vehicles, Air and Missile Defense Systems, Engineering Equipment, Direct fire, Indirect fire, Nonlethal weapons, Ammunition, Automotive Systems, Intelligence Surveillance and Reconnaissance, Ground Soldier Systems, Missiles, Rockets, Mission Command Network, Tactical Command, Control, and Communications, and Robotics/Unmanned Autonomous Systems. These T&E capabilities enable AFC modernization efforts and readiness.

Specific systems supported in FY 2020 with continued support in FY 2021 include: 105-mm Mobile Wheeled Howitzer; 30mm/40mm ammunition; APS; AH-64 Block III; AN/MPQ-64A3 Sentinel 3-D Radar; APR-39C(V)1 Radar; AMPV; AIAMD; ATACMS; CH-47F Chinook; CIRCM; CRS-I; c-UAS; C-RAM; EHETS/MET; ENVG-B; Expedient Leader Follower; ERCA; FMTV; GMLRS; Hypervelocity Gun Weapon System; ITN; Javelin; JAGM for US Navy; JLTV; Leader Radio; M109A7 Paladin/ M992A3 FAASV; M1147 AMP X; M1A2 Abrams SEPv2 NEA; M-2/3 Bradley ExAPS; M-2/3 Bradley Fist; M776 Chrome Tube; M777 Long Range Cannon; M-SHORAD; MPF; MHS; Optionally Manned Fighting Vehicle; PAC-3; PGK; PrSM; RCV; Shadow TUAS; SMET; Stinger SLEP; Stryker; Systems for Assured PNT; THAAD; and UH-60M Black Hawk.

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

Title: Mission Support	FY 2019	FY 2020	FY 2021
	65.180	85.906	89.974

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020		
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)			
2040 / 6	PE 0605601A / Army Test Ranges and Facilities	F30 / Army Test Ranges & Facilities			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019	FY 2020	FY 2021
Description: Funds support: test equipment upgrades and maintenance; test facility maintenance; calibration requirements; handling and disposal of hazardous materials, transportation, postage, administrative supplies; tools; software; spare parts; test support vehicle maintenance; mission unique installation costs; temporary duty/training of civilian and contractor personnel; certifications; printing and reproduction; communications; land leases; and range road maintenance. Funding supports indirect costs for MRTFB Activities (ATC, EPG, WSTC, YTC (including CRTC & TRTC)) IAW DoDI 3200.18 and DoDFMR 7000.14-R.					
FY 2020 Plans: Funds will continue to support test equipment upgrades and maintenance; test facility maintenance; calibration requirements; handling and disposal of hazardous materials, transportation, postage, administrative supplies; tools; software; spare parts; test support vehicle maintenance; mission unique installation costs; temporary duty/training of civilian and contractor personnel; certifications; printing and reproduction; communications; land leases; and range road maintenance. Funding supports indirect costs for MRTFB Activities (ATC, EPG, WSTC, YTC (including CRTC & TRTC)) in accordance with DODI 3200.18 and DODFMR 7000.14-R.					
FY 2021 Plans: Funds will continue to support test equipment upgrades and maintenance; test facility maintenance; calibration requirements; handling and disposal of hazardous materials, transportation, postage, administrative supplies; tools; software; spare parts; test support vehicle maintenance; mission unique installation costs; temporary duty/training of civilian and contractor personnel; certifications; printing and reproduction; communications; land leases; and range road maintenance. Funding supports indirect costs for MRTFB Activities (ATC, EPG, WSTC, YTC (including CRTC & TRTC)) IAW DODI 3200.18 and DODFMR 7000.14-R.					
FY 2020 to FY 2021 Increase/Decrease Statement: Increase in funding will support sustainment of the test capabilities.					
Title: T&E Civilian Pay Description: This funding supports the overhead costs of the civilian labor for Program Budget Guidance (PBG) authorizations. The balance is customer funded. The test customer pays all direct costs that are directly attributable to the use of a test facility or resource for testing of a particular program. Funding is essential to maintain core T&E skills as part of the Government civilian workforce used in support of Army modernization.	143.263	149.297	155.038		
FY 2020 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020	
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)		
2040 / 6	PE 0605601A / Army Test Ranges and Facilities	F30 / Army Test Ranges & Facilities		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
Funds will continue to support the overhead costs of the civilian labor for PBG authorizations. The balance will be customer funded. The test customer will pay all direct costs directly attributable to the use of a test facility or resource for testing of a particular program. Funding will be essential to maintain core T&E skills as part of the Government civilian workforce.				
FY 2021 Plans: Funds will continue to support the overhead costs of the civilian labor for PBG authorizations. The balance will be customer funded. The test customer will pay all direct costs directly attributable to the use of a test facility or resource for testing of a particular program. Funding will be essential to maintain core T&E skills as part of the Government civilian workforce.				
FY 2020 to FY 2021 Increase/Decrease Statement: Increase due to inflation for civilian pay; the majority of the workforce is in the Acquisition Demonstration Program.				
Title: Contractor Support Description: This funding supports contractor labor costs not billable to customers. Contract labor is essential to augment core civilian T&E personnel with additional capabilities and/or capacity. Functions performed include range operations, automotive test support, radar maintenance, warehousing support, project management, maintenance of support fleet aircraft, recurring/general maintenance to test facilities and data acquisition support.		53.658	53.914	41.445
FY 2020 Plans: Funds will continue to support contractor labor costs not billable to the customer. Contract labor will be essential to augment core civilian T&E personnel. Functions performed will include range operations, automotive test support, radar maintenance, warehousing support, project management, maintenance of support fleet aircraft, recurring/general maintenance to test facilities and data acquisition support.				
FY 2021 Plans: Funds will continue to support contractor labor costs not billable to the customer. Contract labor will be essential to augment core civilian T&E personnel. Functions performed will include range operations, automotive test support, radar maintenance, warehousing support, project management, maintenance of support fleet aircraft, recurring/general maintenance to test facilities and data acquisition support.				
FY 2020 to FY 2021 Increase/Decrease Statement: Reduction in contract workforce will limit ATEC's ability to support all projected work. AFC has prioritized ATEC workload and all AFC and other high priority programs will not be impacted. ATEC will take risk on lower priority efforts.				
Title: Revitalization/Upgrade		8.363	5.000	5.000

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605601A / Army Test Ranges and Facilities	Project (Number/Name) F30 / Army Test Ranges & Facilities		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
Description: Funds support the revitalization/upgrade of critical test infrastructure and capabilities. MRTFB elements are required to use institutional funding to sustain, upgrade or create capabilities that support multiple customers. Funding will be focused on improving T&E capabilities for Army Modernization Programs and other high priority acquisition systems.				
FY 2020 Plans: Funds will continue to support the revitalization/upgrade of critical test infrastructure and capabilities. MRTFB elements will be required to use institutional funding to sustain or upgrade capabilities that support multiple customers. Funding will be focused on improving test and evaluation capabilities for the highest priority Army programs.				
FY 2021 Plans: Funds will continue to support the revitalization/upgrade of critical test infrastructure and capabilities. MRTFB elements will be required to use institutional funding to sustain or upgrade capabilities that support multiple customers. Funding will be focused on improving T&E capabilities for the highest priority Army programs such as PrSM and Future Long Range Assault Aircraft (FLRAA).				
Title: Physical Security Guards and Equipment Description: This funding supports security guards mandated by regulation to guard ATEC's Fast Burst Nuclear Reactor (FBR) at WSTC located at WSMR IAW Army Regulation (AR) 190-54 (Security of Nuclear Reactors and Special Nuclear Materials) and Chemical and Biological (Chem/Bio) facilities at West Desert Test Center (WDTC) located at Dugway Proving Ground (DPG) IAW AR 190-59 (Chemical Agent Security Program) and AR 190-17 (Biological Agents and Toxins Security Program). These surety facilities maintain chemical, biological, radiological, nuclear, and explosive (CBRNE) materials and agents in order to test the effects and effectiveness of defensive or protective equipment and measures. The physical security equipment consists of electronic security systems composed of access/egress control systems, closed-circuit television (CCTV), sensors and detection arrays, and Intrusion Detection Systems (IDS). Costs include sustainment of maintenance contracts for equipment not included in the Army inventory. This equipment is necessary to secure arms rooms, ammunition, explosives (AA&E) storage facilities at the FBR, and Chem/Bio surety sites. Physical security equipment is critical to maintain current security requirements as directed in AR 190-54, AR 190-59, AR 190-17, AR 190-11, AR 190-13, and AR 190-51. FY 2020 Plans: Funds will support the physical security guards and equipment for the Fast Burst Nuclear Reactor at WSMR and Chemical Biological facilities at DPG. FY 2021 Plans:				11.157 12.726 12.964

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020	
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)		
2040 / 6	PE 0605601A / Army Test Ranges and Facilities	F30 / Army Test Ranges & Facilities		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
Funds will support the physical security guards and equipment for the FBR at WSTC located at WSMR and CB facilities at WDTC located at DPG.				
FY 2020 to FY 2021 Increase/Decrease Statement: Increase due to inflation for civilian pay and routine program adjustments.				
Title: UH-60 Aircraft		4.516	5.855	5.972
Description: This funding supports the Aviation Restructure Initiative endorsed by the SECDEF. Funding supports aircraft maintenance, aircrew labor, mandatory training, and aircraft flying hours. IAW DoDI 3200.18 and DoDFMR 7000.14-R, these costs are not billable to the test customers. UH-60 helicopters are used to provide essential logistical, sensor platform and aerial photo/video documentation support for developmental testing.				
FY 2020 Plans: Funds will support UH-60 helicopter maintenance, aircrew labor, mandatory training and aircraft flying hours.				
FY 2021 Plans: Funds will support UH-60 helicopter maintenance, aircrew labor, mandatory training and aircraft flying hours.				
FY 2020 to FY 2021 Increase/Decrease Statement: Change is due to program requirement adjustments.				
Title: Network Enterprise Center (NEC)		12.936	12.587	13.786
Description: This funding supports the NEC operations for WSMR and YPG. Funding supports manpower and contracts, support equipment and associated costs specifically identified and measurable to plan, manage, coordinate, and execute Communication, Network, and Information Technology Services Management.				
FY 2020 Plans: Funds will support all labor, support equipment, and training required for the Network Enterprise Center operations at WSTC and YTC.				
FY 2021 Plans: Funds will support all labor, support equipment, and training required for the NEC operations at WSMR and YPG.				
FY 2020 to FY 2021 Increase/Decrease Statement: Change is due to program requirement adjustments.				
Title: Cybersecurity Service Provider (CSSP)		1.557	1.818	1.836

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020		
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)			
2040 / 6	PE 0605601A / Army Test Ranges and Facilities	F30 / Army Test Ranges & Facilities			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019	FY 2020	FY 2021
Description: This requirement supports compliance with DoD Directive (DoDD) 8530.1 and DoDI, which directed that all component information systems and computer networks be assigned to a certified CSSP and that all information systems and computer networks must enter into a service agreement with a CSSP. United States (U.S.) Army Cyber Command (ARCYBER) Operations Order (OPORD) 2014-224 directed all Commands/Direct Reporting Units (DRU) to take immediate measures to ensure Army assets connected to Defense Research and Engineering Network (DREN) and Secure Defense Research and Engineering Network (SDREN) enclaves are aligned with the U.S. Army Research Laboratory as their CSSP to ensure cyber defense oversight and information security continuous monitoring going forward.					
FY 2020 Plans: Funds will support cyber defense oversight and continuous monitoring of information security.					
FY 2021 Plans: Funds will support cyber defense oversight and continuous monitoring of information security.					
FY 2020 to FY 2021 Increase/Decrease Statement: Minor change due to inflation adjustments.					
Title: Military Construction Mission Unique Equipment (MUE)			-	7.000	19.900
Description: In 2017, the Army programmed ATEC's top six Military Construction (MILCON) projects, in response to Congressional interest in the lack of investment and sustainment of MRTFBs and the associated risk to the development of future technology. This unanticipated event has resulted in an emergent requirement for the necessary MUE associated with each project. MUE includes items that are movable and not affixed as an integral part of the facility, but are required to perform the mission of the facility.					
FY 2020 Plans: Funds will support two MUE projects. The Electronic Proving Ground (EPG) Ground Transport Equipment Building Complex will support vehicle and equipment maintenance and provide platforms for the testing, analysis, and storage of C4I systems and Signal Intelligence, and Electronic Combat (EC)/Electronic Warfare (EW) equipment. The White Sands Test Center (WSTC) Information Systems Facility (ISF) will serve as the main hub to inter-connect internal and external White Sands Missile Range (WSMR) data and voice networks used by all test programs, range operations, and other DOD organizations.					
FY 2021 Plans: Funds will support two MUE projects. The RTC Aircraft Test, Instrumentation and Integration Facility (ATIIF) will support instrumentation and maintenance operations, provide the necessary security for sensitive test-related items (to include the aircraft and test support equipment), and provide protection from the weather for the assigned aircraft. The ATIIF will play a vital role in					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605601A / Army Test Ranges and Facilities	Project (Number/Name) F30 / Army Test Ranges & Facilities	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020
RTC's ability to support three high priority programs ? all related to Future Vertical Lift (FVL). The programs are the Future Attack Reconnaissance Aircraft (FARA), Future Long-Range Assault Aircraft (FLRAA), and Improved Turbine Engine (ITE) equipment.			
FY 2020 to FY 2021 Increase/Decrease Statement: Funds are allocated based on program requirements.			
Title: Logistics Readiness Center (LRC)		-	-
Description: This funding supports logistics activities providing support to WSTC located at WSMR, YTC located at YPG, WDTC located at DPG, and RTC located at Redstone Arsenal. These LRC activities provide a wide range of logistics support including but not limited to asset management/property book support; equipment maintenance/repair of ATEC owned maintenance significant items; small arms gaging and repair, dispatch of Army Owned/General Services Administration (GSA) vehicles and equipment; forward fuel support for vehicles and ground power generation equipment; driver's licensing; and transportation support for inbound and outbound equipment, freight and cargo.			4.068
FY 2021 Plans: Funds will support logistics activities providing support to WSTC located at WSMR, YTC located at YPG, WDTC located at DPG, and RTC located at Redstone Arsenal. These LRC activities provide a wide range of logistics support including but not limited to asset management/property book support; equipment maintenance/repair of ATEC owned maintenance significant items; small arms gaging and repair, dispatch of Army Owned/GSA vehicles and equipment; forward fuel support for vehicles and ground power generation equipment; driver's licensing; and transportation support for inbound and outbound equipment, freight and cargo.			
FY 2020 to FY 2021 Increase/Decrease Statement: Funds are allocated based on program requirements.			
Title: FY 2018 National Defense Authorization Act (NDAA) Section 825 Major Defense Acquisition Program (MDAP) Cost Overrun	0.042	-	-
Description: FY 2018 NDAA Section 825 MDAP Cost Overrun			
Title: ARCYBER- C4IM Services Support to WSMR	0.203	0.207	0.214
Description: 3 CMEs- Provide contract support (C4IM services) at WSMR to non-Defense Research and Engineering Network (DREN) customers IAW MOA with ATEC. Supports IMCS contract for touch labor.			
FY 2020 Plans: The Fort Bliss Network Enterprise Center (NEC) has a new requirement to migrate users and services from the White Sands network to the Fort Bliss Network. Fort Bliss does not have enough storage and computing capacity to migrate all the Servers and			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605601A / Army Test Ranges and Facilities	Project (Number/Name) F30 / Army Test Ranges & Facilities	
B. Accomplishments/Planned Programs (\$ in Millions) User Data to Fort Bliss. The NEC requires additional storage and computing capacity to support these requirements. The system must integrate into the existing VMware platform, IFN architecture, and GFN architecture.			FY 2019
FY 2021 Plans: The Fort Bliss Network Enterprise Center (NEC) will continue to migrate users and services from the White Sands network to the Fort Bliss Network. Fort Bliss does not have enough storage and computing capacity to migrate all the Servers and User Data to Fort Bliss. The NEC requires additional storage and computing capacity to support these requirements. The system must integrate into the existing VMware platform, IFN architecture, and GFN architecture.			FY 2020
FY 2020 to FY 2021 Increase/Decrease Statement: xxx			FY 2021
Title: AMC / AFC Physical Security Officer Civ Pay		0.152	0.158
Description: AMC / AFC Physical Security Officer Civ Pay			0.162
FY 2020 Plans: AMC / AFC Physical Security Officer Civ Pay			
FY 2021 Plans: AMC / AFC Physical Security Officer Civ Pay			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding change reflects planned lifecycle of this effort.			
Accomplishments/Planned Programs Subtotals			301.027
FY 2019			FY 2020
Congressional Add: Cybersecurity Vulnerability and Assessment Test Environment (CVATE)	10.000	-	
FY 2019 Accomplishments: Cybersecurity Vulnerability and Assessment Test Environment (CVATE)			
Congressional Add: Soil Research for Army Training Ranges	-	2.000	
FY 2020 Plans: Soil Research for Army Training Ranges			
Congressional Adds Subtotals			10.000
C. Other Program Funding Summary (\$ in Millions)			2.000
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605601A / Army Test Ranges and Facilities	Project (Number/Name) F30 / Army Test Ranges & Facilities
C. Other Program Funding Summary (\$ in Millions)		
Remarks		
D. Acquisition Strategy N/A		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0605602A / Army Technical Test Instrumentation and Targets							
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	82.617	61.974	48.475	-	48.475	49.774	74.230	56.520	60.338	0.000	433.928
628: Developmental Test Technology & Sustainment	-	66.498	48.215	34.251	-	34.251	35.081	59.168	41.051	44.868	0.000	329.132
62C: Modeling and Simulation Instrumentation	-	16.119	13.759	14.224	-	14.224	14.693	15.062	15.469	15.470	0.000	104.796

A. Mission Description and Budget Item Justification

This Program Element (PE) provides critical front-end investments for development of: new test methodologies; test standards; advanced test technology concepts for long range requirements; future test capabilities; advanced development of Modeling and Simulation and Instrumentation (MS&I) prototypes; and the full development of test instrumentation for the United States (U.S) Army Test and Evaluation Command (ATEC), which includes the Operational Test Command (OTC) at Ft Hood, Texas; Aberdeen Test Center (ATC), Aberdeen Proving Ground, Maryland; White Sands Test Center (WSTC) at White Sands Missile Range (WSMR), New Mexico; Electronic Proving Ground (EPG), Fort Huachuca, Arizona; Yuma Test Center (YTC) at Yuma Proving Grounds (YPG), Arizona (including the Cold Regions Test Center (CRTC), Fort Greely, Alaska and the Tropics Regions Test Center (TRTC), at various locations); and Redstone Test Center (RTC), Redstone Arsenal, Alabama. OTC consists of three forward Test Directorates (Airborne and Special Operations Test Directorate, Fort Bragg, North Carolina; Air Defense Artillery Test Directorate, Fort Bliss, Texas; and the Fires Test Directorate, Fort Sill, Oklahoma) together with four other Test Directorates (Aviation; Maneuver; Mission Command; Maneuver Support and Sustainment) at Ft Hood, Texas. These activities enable Army Futures Command (AFC) modernization effort and readiness and support the development and fielding cycle of all Army acquisition programs including rapid fielding initiatives. Sustainment funding maintains existing testing capabilities at all locations by replacing unreliable, uneconomical, and irreparable instrumentation, as well as incremental upgrades of hardware and software for MS&I systems to assure adequate test data collection capabilities. This data supports acquisition milestone decisions for all commodity areas throughout the Army including programs such as the 105-mm Mobile Howitzer, 30mm/40mm ammunition, Active Protection System (APS), AH-64 Block III, AN/MPQ-64A3 Sentinel 3-D Radar, APR-39C(V)1 Radar, Armored Multi-Purpose Vehicle (AMPV), Army Integrated Air-Missile Defense (AIAMD), Army Tactical Missile System (ATACMS), CH-47F Chinook, Common Infrared Counter Measures (CIRCM), Common Robotic System-Individual (CRS-I), Counter Unmanned Aircraft System (c-UAS), Counter Rocket Artillery Mortar (C-RAM), Counter Unmanned Aircraft System (C-UAS), Enhanced Heavy Equipment Transporter System (EHETS/Medium Equipment Trailer (MET), Enhanced Night Vision Goggle - Binocular (ENVG-B), Expedient Leader Follower, Extended Range Cannon Artillery (ERCA), Family of Medium Tactical Vehicles (FMTV), Guided Multiple Launch Rocket System (GMLRS), Hypervelocity Gun Weapon System, Integrated Tactical Network (ITN), Javelin, Joint Air-to-Ground Missile (JAGM) for US Navy, Joint Light Tactical Vehicle (JLTV), Leader Radio, M109A7 Paladin/M992A3 Field Artillery Ammunition Supply Vehicle (FAASV), M1147 Advanced Multi-Purpose X (AMP), M1A2 Abrams SEPv2 Next Evolution Armor (NEA), M-2/3 Bradley Expedited Active Protection System (ExAPS), M-2/3 Bradley Fist, M776 Chrome Tube, M777 Long Range Cannon, Maneuver Short Range Air Defense (M-SHORAD), Mobile Protected Firepower (MPF), Modular Handgun System (MHS), Optionally Manned Fighting Vehicle, Patriot 3 (PAC-3), Precision Guidance Kit (PGK), Precision Strike Missile (PrSM), Robotic Combat Vehicle (RCV), Shadow Tactical Unmanned Aircraft System (TUAS), Squat Multipurpose Equipment Transport (SMET), Stinger Shelf life Extension Program (SLEP), Stryker, Systems for Assured Position, Navigation and Timing (PNT), Terminal High-Altitude Area Defense (THAAD), and UH-60M Black Hawk.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army					Date: February 2020
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605602A / <i>Army Technical Test Instrumentation and Targets</i>				
B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	84.805	46.974	48.132	-	48.132
Current President's Budget	82.617	61.974	48.475	-	48.475
Total Adjustments	-2.188	15.000	0.343	-	0.343
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	15.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.188	-			
• Adjustments to Budget Years	-	-	0.343	-	0.343
Congressional Add Details (\$ in Millions, and Includes General Reductions)					
Project: 628: Developmental Test Technology & Sustainment	FY 2019	FY 2020			
Congressional Add: <i>Developmental Test Technology & Sustainment</i>	22.500	15.000			
Congressional Add Subtotals for Project: 628	22.500	15.000			
Congressional Add Totals for all Projects	22.500	15.000			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 6					PE 0605602A / Army Technical Test Instrumentation and Targets				628 / Developmental Test Technology & Sustainment				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
628: Developmental Test Technology & Sustainment	-	66.498	48.215	34.251	-	34.251	35.081	59.168	41.051	44.868	0.000	329.132	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification												
This Project provides critical front-end investments for development of new test methodologies, test standards, advanced test technology concepts for long range requirements, future test capabilities, and advanced instrumentation prototypes for subordinate commands of the Army Test and Evaluation Command (ATEC). These capabilities are required to support developmental testing requirements of high priority Army systems supporting Army modernization efforts. Where practical, efficiencies will be gained through the common use of developmental instrumentation in operational testing. A key element is sustaining aging instrumentation which maintains existing capabilities at test facilities by replacing unreliable, uneconomical and irreparable instrumentation, as well as lifecycle replacement and incremental upgrades of instrumentation and software, reducing their average age to assure adequate testing capabilities. This Project develops and sustains developmental test instrumentation and capabilities that provide the data necessary to support acquisition milestone decisions for all commodity areas throughout the Army. Significant examples include new instrumentation for the testing of Command, Control, Communication and Computer (C4) systems, upgrades to existing radars to extend their economic life, common data collection and analysis tools, non-intrusive instrumentation to test Unmanned Ground Vehicles and sensors, high speed - high definition digital imaging systems to capture missile flight events, and automation software to improve data collection of reliability, availability, and maintainability (RAM) testing.												
B. Accomplishments/Planned Programs (\$ in Millions)												
Title: Developmental Test Technology Investment Description: Develops, acquires, and sustains critical test technology and instrumentation. Provides the necessary test instrumentation, computer and communications systems, data collection, analysis and reporting equipment, and other special test capabilities to successfully develop and test Army weapons and equipment. Provides the necessary live, virtual and constructive environment, hardware-in-the-loop capabilities, and modeling and simulation (M&S) needed for testing Army materiel solutions. Acquires instrumentation to measure performance of C4 systems; RAM data collection on tracked and wheeled vehicles; ballistic transducers for measuring chamber pressures during ammunition and barrel tests; supports development of common data collection instrumentation and data management systems used in testing across all test commodity areas and lifecycles; continues replacement and upgrade of range control instrumentation, radar, optics and telemetry used in missile testing; acquires data recorders, signal conditioning equipment, data processing equipment and other instrumentation for various aircraft tests; upgrades natural environments test instrumentation used for testing weapon systems, vehicles, munitions and support equipment in extreme hot desert environments as well as extreme cold conditions; continues upgrade of survivability/vulnerability test capabilities in support of live fire testing; upgrades and replaces mobile range communications equipment and digital end devices; and improves test efficiency through the use of smart devices as data collectors.										FY 2019	FY 2020	FY 2021
										43.984	31.848	34.251

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020		
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019	FY 2020	FY 2021
FY 2020 Plans: Test centers will continue to provide, acquire, and upgrade instrumentation for C4, RAM, ballistics, missile, aviation and environmental testing across all test commodity areas and enhance/expand the use of common data collectors, smart devices, and enterprise data management tools. Examples include Aberdeen Test Center Crew Survivability Instrumentation during Live Fire Test and Evaluation (LFT&E); Electronic Proving Ground Phoenix Architecture project for future data demand; Redstone Test Center Aircraft Survivability Equipment (ASE) Data Processing and Analysis; White Sands Missile Range Aerial Cable Lifecycle Replacement project to replace critical components reaching the end of their useful lives; and Yuma Test Center Counter Unmanned Aircraft System (cUAS) test capability for anticipated cUAS technology systems which can detect, track, identify and collect data on hostile Unmanned Aircraft System systems.					
FY 2021 Plans: Test centers will continue to provide, acquire, and upgrade instrumentation for Command, Control, Communications, and Computers Intelligence, Surveillance and Reconnaissance (C4ISR), RAM, automotive, ballistics, missile, aviation and environmental testing across all test commodity areas and enhance/expand the use of common data collectors, smart devices, and enterprise data management tools. Examples include ATC Crew Survivability Instrumentation during LFT&E; EPG Phoenix Architecture project for future data demand; RTC ASE Data Processing and Analysis; WSMR Long Range Precision Fires (LRPF) and Air Missile Defense (AMD) test support equipment; and YTC test capability for cUAS which can detect, track, identify and collect data on hostile UAS.					
FY 2020 to FY 2021 Increase/Decrease Statement: Funding adjustments align program requirements with Army modernization priorities in support of the National Defense Strategy.					
Title: FY 2018 National Defense Authorization Act (NDAA) Section 825 Major Defense Acquisition Program (MDAP) Cost Overrun Description: FY 2018 NDAA Section 825 MDAP Cost Overrun	0.014	-	-	-	-
Title: FY 2020 SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC ?638	-	1.367	-	-	-
FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638					
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638					
Accomplishments/Planned Programs Subtotals			43.998	33.215	34.251

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605602A / Army Technical Test Instrumentation and Targets	Project (Number/Name) 628 / Developmental Test Technology & Sustainment	
		FY 2019	FY 2020
Congressional Add: Developmental Test Technology & Sustainment		22.500	15.000
FY 2019 Accomplishments: Developmental Test Technology & Sustainment			
FY 2020 Plans: Developmental Test Technology & Sustainment			
	Congressional Adds Subtotals	22.500	15.000
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 6					PE 0605602A / Army Technical Test Instrumentation and Targets				62C / Modeling and Simulation Instrumentation				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
62C: Modeling and Simulation Instrumentation	-	16.119	13.759	14.224	-	14.224	14.693	15.062	15.469	15.470	0.000	104.796	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The U.S. ATEC plans, executes, and reports on operational tests, assessments and experiments in order to provide essential information for the acquisition and fielding of Army systems. A subordinate unit of ATEC, the OTC employs MS&I to provide a realistic operational test (OT) environment, conduct test monitoring and control, and perform data analysis. OTC develops and adapts Army training simulations (such as Multiple Integrated Laser Engagement System (MILES) and One Semi-Automated Forces (OneSAF)) for use in OT, reducing the demand for Army test units and test cost by simulating tactical engagements, adjacent & higher headquarters units, mission command message traffic, and battlefield effects. OTC provides test monitoring and control through video monitoring, Global Positioning System (GPS)-enabled networks, and integration with Army mission command systems to collect real-time position location and status tracking to ensure test safety and provide status of data collection devices. OTC uses video equipment, data collection devices, and software to collect and analyze system performance during test. MS&I funding is used to adapt/integrate current Army training simulation capabilities to function with new Army systems, purchase commercial off-the-shelf systems, and develop and sustain OT-unique simulation and instrumentation systems. The MS&I program also funds the technical expertise and hardware to sustain cyber security of OTC's technology capabilities, and provides for minor data collection device development and sustainment to support systems undergoing OT.

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

	FY 2019	FY 2020	FY 2021
<p>Title: MS&I</p> <p>Description: Develops and enhances ATEC's simulation/stimulation of Mission Command; Fire Support; Air Defense; Command, Control, Communications, and Computers Intelligence, Surveillance and Reconnaissance (C4ISR); and Network systems. Improves and sustains Real-Time Casualty Assessment (RTCA). Also develops, enhances, and sustains Performance Instrumentation Systems, Time Space Positioning Information (TSPI), Telemetry Systems, and Imaging Systems together with their associated data management enabling capabilities.</p> <p>FY 2020 Plans: Will continue to sustain ATEC's Fire Support, Air and Missile Defense, C4ISR, and Network OT tools. Will improve OTC's RTCA secure network and tactical engagement simulation system capabilities to support future Bradley, Global Position System III, Indirect Fire Protection Capability (IFPC), Patriot PDB-8, and Integrated Air and Missile Defense (IAMD) OTs. Will support the IAMD, DCGS-A, Manpack, Joint Enterprise Network Manager (JENM), Leaders Radio, and Shadow (RQ-7BVN) TUAS OTs. Will sustain Performance Instrumentation Systems, TSPI, and Telemetry and Imaging Systems and associated data management</p>	16.114	13.134	14.224

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605602A / Army Technical Test Instrumentation and Targets	Project (Number/Name) 62C / Modeling and Simulation Instrumentation	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020
(e.g. collection, reduction, analysis, and visualization) enabling capabilities. Will execute life cycle replacement of legacy MS&I systems which have reached end of useful life. Will sustain and upgrade MS&I systems used for operational tests.			
FY 2021 Plans: Will continue to sustain ATEC's Fire Support, Air and Missile Defense, C4ISR, and Network OT tools. Will improve OTC's RTCA secure network and tactical engagement simulation system capabilities to support future Armored Multi-Purpose Vehicle (AMPV), Bradley, IFPC, Joint Warning and Reporting Network (JWARN) and Mobile Protected Firepower (MPF) OTs. Will also support the Army Integrated Air Missile Defense (AIAMD), Distributed Common Ground System-Army (DCGS-A), Global Combat Support System ? Army (GCSS-A) and Shadow (RQ-7BVN) TUAS OTs. Will sustain Performance Instrumentation Systems, TSPI, and Telemetry and Imaging Systems and associated data management (e.g. collection, reduction, analysis, and visualization) enabling capabilities. Will execute life cycle replacement of legacy MS&I systems which have reached end of useful life. Will sustain and upgrade MS&I systems used for operational tests.			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding was adjusted to align program requirements with Army modernization priorities in support of the National Defense Strategy.			
Title: FY 2018 NDAA Section 825 MDAP Cost Overrun	0.005	-	-
Description: FY 2018 NDAA Section 825 MDAP Cost Overrun			
Title: FY 2020 SBIR/STTR Transfer	-	0.625	-
Description: Funding transferred in accordance with Title 15 USC ?638			
FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals		16.119	13.759
14.224			
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army	Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605602A / Army Technical Test <i>Instrumentation and Targets</i>	Project (Number/Name) 62C / Modeling and Simulation <i>Instrumentation</i>
D. Acquisition Strategy N/A		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0605604A / Survivability/Lethality Analysis							
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	39.886	35.075	36.001	-	36.001	36.839	35.670	36.365	36.369	0.000	256.205
675: Army Survivability Analysis & Evaluation Supp	-	39.886	35.075	36.001	-	36.001	36.839	35.670	36.365	36.369	0.000	256.205

A. Mission Description and Budget Item Justification

This Program Element (PE) funds objective vulnerability assessment products necessary for the inherently-governmental Army Test & Evaluation Command/Army Evaluation Center (ATEC/ AEC) mission, for the Research and Development communities as well as the Analytical communities. Products result from investigating, analyzing, assessing, experimenting and reporting on the survivability of Soldiers, and on the survivability, lethality and vulnerability (SLV) of the highest-priority Army and threat systems. Products are leveraged within the Army Futures Command and the Program Manager / Program Executive Office (PM/PEO) community to exercise constructive design influence over materiel development and to provide credible engineering-level underpinning and input to the Army Analytical Community. While the Army is at war, analytical results funded by this PE are also directly leveraged for urgent materiel releases and support to current operations.

This PE provides quantitative lethality and survivability analyses and data for fielded and developmental systems as the Army pursues its modernization priorities and ensures readiness through the fielding of lethal and survivable systems for multi-domain operations. PE funds engineering level SLV analysis in the areas of Long Range Precision Fires systems, Next Generation Combat Vehicles, Future Vertical Lift, Network/C3I, Air & Missile Defense, Soldier Lethality, and other highest Army priority efforts in the threat competencies of ballistics, electronic warfare, and cyber.

Vulnerability assessments funded by this PE are conducted across the spectrum of multi-domain battlefield threats to include: guns, missiles, mines and other methods of inflicting physical damage; jammers, countermeasures, and other electronic warfare techniques; cyber threats from insiders to external nation states; and directed energy weapons. Many different kinds of technical capabilities are used to generate these analyses, including specialized equipment, modeling & simulation, and experimental facilities. This PE ensures these capabilities can represent a credible live, virtual, or constructive hostile environment required for vulnerability assessment, thus enabling evaluators, developers, users, and decision makers to make informed SLV judgments for both Soldiers and materiel. These technical survivability and lethality details: enable properly informed decisions concerning acquisition and production; maximize Army overmatch in systems and tactics; inform investment priorities; and mitigate system weaknesses prior to actual combat.

Technical data and analysis results funded by this PE are efficiently leveraged for many different Army uses, reducing total cost to the Army by eliminating the need for duplicative capabilities funded by individual system developers. Central funding of this mission assures accurate and consistent treatment of survivability and lethality across all classes of systems, across all formal system Evaluations, and across the Army's analytical community as it conducts analyses of alternatives and other studies. The U.S Army Combat Capabilities Development Command (CCDC) and ATEC/AEC integrate the SLV work program into Army's formal Evaluation process to ensure ATEC can comply with its legally-mandated responsibility to assess system survivability along with effectiveness and suitability.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army					Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)				
2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	PE 0605604A / <i>Survivability/Lethality Analysis</i>				
B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	40.480	35.075	35.881	-	35.881
Current President's Budget	39.886	35.075	36.001	-	36.001
Total Adjustments	-0.594	0.000	0.120	-	0.120
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.594	-			
• Adjustments to Budget Years	-	-	0.120	-	0.120

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)					Project (Number/Name)			
2040 / 6					PE 0605604A / Survivability/Lethality Analysis					675 / Army Survivability Analysis & Evaluation Supp			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
675: Army Survivability Analysis & Evaluation Supp	-	39.886	35.075	36.001	-	36.001	36.839	35.670	36.365	36.369	0.000	256.205	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds objective vulnerability assessment products necessary for the inherently-governmental Army Test & Evaluation Command/Army Evaluation Center (ATEC/ AEC) mission, for the Research and Development communities as well as the Analytical communities. Products result from investigating, analyzing, assessing, experimenting and reporting on the survivability of Soldiers, and on the survivability, lethality and vulnerability (SLV) of the highest-priority Army and threat systems. Products are leveraged within the Army Futures Command and the Program Manager / Program Executive Office (PM/PEO) community to exercise constructive design influence over materiel development and to provide credible engineering-level underpinning and input to the Army Analytical Community. While the Army is at war, analytical results funded by this Project are also directly leveraged for urgent materiel releases and support to current operations.

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Vulnerability assessments funded by this Project are conducted across the spectrum of multi-domain battlefield threats to include: guns, missiles, mines and other methods of inflicting physical damage; jammers, countermeasures, and other electronic warfare techniques; cyber threats from insiders to external nation states; and directed energy weapons. Many different kinds of technical capabilities are used to generate these analyses, including specialized equipment, modeling & simulation, and experimental facilities. This Project ensures these capabilities can represent a credible live, virtual, or constructive hostile environment required for vulnerability assessment, thus enabling evaluators, developers, users, and decision makers to make informed SLV judgments for both Soldiers and materiel. These technical survivability and lethality details: enable properly informed decisions concerning acquisition and production; maximize Army overmatch in systems and tactics; inform investment priorities; and mitigate system weaknesses prior to actual combat.

Technical data and analysis results funded by this Project are efficiently leveraged for many different Army uses, reducing total cost to the Army by eliminating the need for duplicative capabilities funded by individual system developers. Central funding of this mission assures accurate and consistent treatment of survivability and lethality across all classes of systems, across all formal system Evaluations, and across the Army's analytical community as it conducts analyses of alternatives and other studies. The U.S Army Combat Capabilities Development Command (CCDC) and ATEC/AEC integrate the SLV work program into Army's formal Evaluation process to ensure ATEC can comply with its legally-mandated responsibility to assess system survivability along with effectiveness and suitability.

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

Title: Survivability, Lethality, Vulnerability Analyses (SLVA) for Ground, Aviation, Munitions, and Soldier Systems

FY 2019	FY 2020	FY 2021
18.621	15.604	16.370

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020		
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)			
2040 / 6	PE 0605604A / Survivability/Lethality Analysis	675 / Army Survivability Analysis & Evaluation Supp			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019	FY 2020	FY 2021
<p>Description: This activity provides integrated multi-domain SLV for CSA and other highest priority Ground, Aviation, Munitions, and Soldier Systems.</p> <p>FY 2020 Plans: Will conduct SLVA on Long Range Precision Fires, Next Generation Combat Vehicle, Future Vertical Lift, and Soldier lethality systems, and on AEC and RDECOM's highest priority platform and weapon systems. For systems supported will work with materiel developers to constructively influence system design and will provide relevant data to Army analytical community to for supporting Analyses of Alternatives and other Army studies.</p> <p>FY 2021 Plans: Will conduct SLVA on Long Range Precision Fires, Next Generation Combat Vehicle, Future Vertical Lift, and Soldier lethality systems, and on AEC and CCDC's highest priority platform and weapon systems. For systems supported, working with materiel developers to constructively influence system design and providing relevant data to Army analytical community for supporting Analyses of Alternatives and other Army studies.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: FY 2021 increase supports anticipated mission requirements.</p>					
<p>Title: Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) System Survivability Assessments</p> <p>Description: This effort produces assessments of the survivability of C4ISR systems in EW and cyber threat environments and conducts Electronic Attack (EA) and cyber analyses that reveal critical vulnerabilities in C4ISR systems. It also defines, demonstrates, and recommends mitigation options to proponents and evaluators of C4ISR. A cyber vulnerability database is maintained for the benefit of the community.</p> <p>FY 2020 Plans: Will conduct cyber and EW SLVA on network components as specified by the Network C3I CFT and AEC and on RDECOM's highest priority Network/C3 and other systems. For systems supported will work with materiel developers to constructively influence system design and will provide relevant data to Army analytical community to support Analyses of Alternatives and other Army studies. Cyber support includes resiliency assessments of systems and Soldiers together and verification of fixes to identified vulnerabilities.</p> <p>FY 2021 Plans: Will conduct cyber and EW SLVA on network components as specified by the Network C3I CFT and AEC and on CCDC's highest priority Network/C3 and other systems. For systems supported working with materiel developers to constructively influence</p>	19.662	17.006	18.075		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605604A / Survivability/Lethality Analysis	Project (Number/Name) 675 / Army Survivability Analysis & Evaluation Supp		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
system design and providing relevant data to Army analytical community to support Analyses of Alternatives and other Army studies. Cyber support includes resiliency assessments of systems and Soldiers together and verification of fixes to identified vulnerabilities.				
<p>FY 2020 to FY 2021 Increase/Decrease Statement: FY2021 increase supports anticipated mission requirements.</p> <p>Title: Survivability, Lethality, Vulnerability (SLV) Analyses for Developmental Air and Missile Defense Systems</p> <p>Description: Conduct integrated SLV analyses for developmental air and missile defense systems, pre-planned product improvements of current systems, and recently fielded systems.</p>				1.601
<p>FY 2020 Plans: Will conduct high-priority SLVA on AMD systems and components as specified by AEC and RDECOM. For systems supported will work with materiel developers to constructively influence system design and will provide relevant data to Army analytical community to support Analyses of Alternatives and other Army studies.</p>				0.872
<p>FY 2021 Plans: Will conduct high-priority SLVA on AMD systems and components as specified by AEC and CCDC. For systems supported working with materiel developers to constructively influence system design and providing relevant data to Army analytical community to support Analyses of Alternatives and other Army studies.</p>				1.556
<p>FY 2020 to FY 2021 Increase/Decrease Statement: FY2021 increase supports anticipated mission requirements.</p> <p>Title: FY 2018 NDAA SEC 825 MDAP Cost Overrun</p> <p>Description: FY 2018 NDAA SEC 825 MDAP Cost Overrun</p>				0.002
<p>Title: FY 2020 SBIR/STTR Transfer</p> <p>Description: Funding transferred in accordance with Title 15 USC 638</p>				-
<p>FY 2020 Plans: Funding transferred in accordance with Title 15 USC 638</p>				1.593
<p>FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638</p>				-
Accomplishments/Planned Programs Subtotals				39.886
35.075				36.001

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army	Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605604A / <i>Survivability/Lethality Analysis</i>	Project (Number/Name) 675 / <i>Army Survivability Analysis & Evaluation Supp</i>
C. Other Program Funding Summary (\$ in Millions)		
N/A		
Remarks		
D. Acquisition Strategy		
N/A		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					R-1 Program Element (Number/Name) PE 0605606A / Aircraft Certification								
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
Total Program Element	-	3.796	3.461	2.736	-	2.736	2.726	2.715	2.702	2.239	Continuing	Continuing	
092: Aircraft Certification	-	3.796	3.461	2.736	-	2.736	2.726	2.715	2.702	2.239	Continuing	Continuing	

A. Mission Description and Budget Item Justification

The Airworthiness Certification Program Element (PE) assures safe flight operation of Army aircraft and aviation systems by means of technical design approval and qualification of systems to appropriate airworthiness standards. This PE supports independent airworthiness qualification for all assigned developmental and in-production Army aircraft, both manned and unmanned, as required by Army Regulation (AR) 70-62 ("Airworthiness of Aircraft Systems"), and is essential for assuring the safe operation of Army aircraft. This PE performs engineering functions (design, analysis, testing, demonstrations, and system specification compliance) essential for certifying the airworthiness of nearly 20,000 assigned Army aircraft. This PE also supports: management/execution of the Army's Aeronautical Design Standards (ADS) program; management/execution of airworthiness approval for new systems and materiel changes for all assigned Army aircraft systems; airworthiness engineering support for major development/modification and future systems/ subsystems requirements of the Program Executive Officer for Aviation (PEO AVN) and U.S. Army Special Operations Command's Technology Applications Program Office (TAPO); and management of test and evaluation processes in support of the airworthiness qualification process. The Airworthiness Certification PE also performs general research and development in support of aircraft qualification and overarching airworthiness projects that involve multiple aircraft models, and supports the application of other critical aviation subsystems onto Army aircraft.

This PE also supports: airworthiness certification for military-use civil derivative aircraft technical qualification through the Federal Aviation Administration's Military Certification Office; development of airworthiness procedures, specifications, critical standards, and other design and qualification documents; participation in senior leadership mandated airworthiness tri-service activities (e.g., National Airworthiness Council) and international airworthiness related activities mandated by treaty (e.g., Flight Into Non-segregated Airspace (FINAS)); and early airworthiness involvement in Technology Transition projects such as the Future Attack Reconnaissance Aircraft, Future Long Range Assault Aircraft, Advanced Unmanned Aircraft Systems, Modular Open System Architecture, and other Office of the Secretary of Defense (OSD) initiatives.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army					Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)				
2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	PE 0605606A / <i>Aircraft Certification</i>				
B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	3.936	3.461	2.738	-	2.738
Current President's Budget	3.796	3.461	2.736	-	2.736
Total Adjustments	-0.140	0.000	-0.002	-	-0.002
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.140	-			
• Adjustments to Budget Years	-	-	-0.002	-	-0.002

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605606A / Aircraft Certification				Project (Number/Name) 092 / Aircraft Certification				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
092: Aircraft Certification	-	3.796	3.461	2.736	-	2.736	2.726	2.715	2.702	2.239	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			

A. Mission Description and Budget Item Justification

The Airworthiness Certification Project assures safe flight operation of Army aircraft and aviation systems by means of technical design approval and qualification of systems to appropriate airworthiness standards. This Project supports independent airworthiness qualification for all assigned developmental and in-production Army aircraft, both manned and unmanned, as required by Army Regulation (AR) 70-62 ("Airworthiness of Aircraft Systems"), and is essential for assuring the safe operation of Army aircraft. This Project performs engineering functions (design, analysis, testing, demonstrations, and system specification compliance) essential for certifying the airworthiness of nearly 20,000 assigned Army aircraft. This Project also supports: management/execution of the Army's Aeronautical Design Standards (ADS) program; management/execution of airworthiness approval for new systems and materiel changes for all assigned Army aircraft systems; airworthiness engineering support for major development/modification and future systems/ subsystems requirements of the Program Executive Officer for Aviation (PEO AVN) and U.S. Army Special Operations Command's Technology Applications Program Office (TAPO); and management of test and evaluation processes in support of the airworthiness qualification process. The Airworthiness Certification Project also performs general research and development in support of aircraft qualification and overarching airworthiness projects that involve multiple aircraft models, and supports the application of other critical aviation subsystems onto Army aircraft.

This Project also supports: airworthiness certification for military-use civil derivative aircraft technical qualification through the Federal Aviation Administration's Military Certification Office; development of airworthiness procedures, specifications, critical standards, and other design and qualification documents; participation in senior leadership mandated airworthiness tri-service activities (e.g., National Airworthiness Council) and international airworthiness related activities mandated by treaty (e.g. Flight Into Non-segregated Airspace (FINAS)); and early airworthiness involvement in Technology Transition projects such as the Future Attack Reconnaissance Aircraft, Future Long Range Assault Aircraft, Advanced Unmanned Aircraft Systems, Modular Open System Architecture, and other Office of the Secretary of Defense (OSD) initiatives.

Work in this Project is performed by the United States Army Futures Command (AFC).

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Title: Certification Assessments and Studies Force Modernization Aircraft	0.042	0.011	-
Description: Perform assessments and studies in support of Force Modernization Aircraft Systems			
FY 2020 Plans: Will conduct technical and airworthiness qualification assessments and studies to demonstrate airworthiness and system performance for Army force modernization aircraft systems or multi-system programs (e.g. AH-64E, UH-60M, MH-47G, MH-60M, etc).			
FY 2020 to FY 2021 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605606A / Aircraft Certification	Project (Number/Name) 092 / Aircraft Certification	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019 FY 2020 FY 2021
Funding requirements change due to consolidation of this item within the Certification Requirements and Studies item below.			
Title: Certification Requirements and Studies for Force Modernization Aircraft, Future Aircraft, and Advanced Aircraft Technologies		0.512	0.419
Description: Perform studies to support airworthiness certification requirements for Force Modernization and Future Aircraft Systems.		0.815	
FY 2020 Plans: Will conduct studies of Airworthiness Certification requirements for future aircraft systems and other technology transition programs (e.g. Joint Multi-Role Technology Demonstrator Aircraft, Future Vertical Lift Aircraft, Improved Turbine Engine Program)			
FY 2021 Plans: Will refine AMACC document. Will conduct technical and airworthiness qualification assessments, projects, and studies to demonstrate airworthiness and system performance for Army force modernization aircraft systems and multi-system programs (e.g. AH-64E, UH-60M, MH-47G, MH-60M, etc). Will conduct studies of Airworthiness Certification requirements for future aircraft systems and other advanced technology transition programs (e.g. Future Attack Reconnaissance Aircraft, Future Long Range Assault Aircraft, Advanced Unmanned Aircraft Systems, Modular Open System Architecture). These efforts will include extensive, multi-faceted interactions and collaborations with government RDTE Centers, academia, US industry, professional aerospace technical societies, and international partners to fully understand advanced aviation technologies and proposed airworthiness certification criteria, standards, and methods of compliance.			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding change due to the consolidation of the Certification Assessments and Studies Force Modernization Aircraft effort and the Certification Assessments of Technology Upgrades effort into this item - Certification Requirements and Studies for Force Modernization Aircraft, Future Aircraft, and Aircraft Technologies.			
Title: Design Standards		2.023	1.891
Description: Support the development, implementation and maintenance of Army Aeronautical Design Standards, airworthiness procedures and tools, and overarching Airworthiness qualification documentation.		1.437	
FY 2020 Plans: Will develop, implement, and maintain Army Aeronautical Design Standards, airworthiness procedures and tools, and overarching airworthiness qualification documentation.			
FY 2021 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605606A / Aircraft Certification	Project (Number/Name) 092 / Aircraft Certification	
B. Accomplishments/Planned Programs (\$ in Millions) Will develop, implement, and maintain Army Aeronautical Design Standards, airworthiness procedures and tools, and overarching airworthiness qualification documentation.	FY 2019	FY 2020	FY 2021
FY 2020 to FY 2021 Increase/Decrease Statement: Funding realigned within project.			
Title: Certification Assessments of Technology Upgrades Description: Perform certification assessments of technology upgrades.	0.042	0.011	-
FY 2020 Plans: Will conduct technical and airworthiness certification assessments of technology upgrades to Army force modernization aircraft systems or programs (e.g. Advanced Threat Infrared Countermeasures integration, Common Missile Warning System integration, Common Sensor integration).			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding and requirements change due to consolidation of this item within the Certification Requirements and Studies item above.			
Title: Commercial Derivative Aircraft Description: Technical and airworthiness qualification for Commercial Derivative Aircraft.	0.370	0.296	0.242
FY 2020 Plans: Will provide technical and airworthiness qualification for Commercial Derivative Aircraft through the Federal Aviation Administration.			
FY 2021 Plans: Will provide technical and airworthiness qualification for Commercial Derivative Aircraft through the Federal Aviation Administration.			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding realigned within the project.			
Title: Aircraft Fleet Airworthiness Certification Advancement and Synchronization Description: Support efforts to establish and maintain aircraft safety for a fleet of aircraft.	0.807	0.676	0.242
FY 2020 Plans: Will lead and participate in national and international airworthiness certification committees, conferences and working groups responsible for establishing and maintaining aircraft safety for a fleet of aircraft (e.g. National Airworthiness Council, Joint			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020				
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605606A / Aircraft Certification	Project (Number/Name) 092 / Aircraft Certification					
B. Accomplishments/Planned Programs (\$ in Millions) Aeronautical Commanders Group, Joint Propulsion Coordinating Committee, NATO Airworthiness working groups, ASIC Airworthiness Working Groups, and Global Air Traffic Management working groups.) FY 2021 Plans: Will lead and participate in national and international airworthiness certification committees, conferences and working groups responsible for establishing, maintaining, and synchronizing aircraft safety for fleets of aircraft (e.g. National Airworthiness Council, Joint Propulsion Coordinating Committee, NATO Airworthiness working groups, AFIC Airworthiness working groups, and Global Air Traffic Management working groups.) FY 2020 to FY 2021 Increase/Decrease Statement: Funding redistributed within the project.	FY 2019	FY 2020	FY 2021				
Title: FY 2020 SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC ?638	-	0.157	-				
FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638							
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638							
	Accomplishments/Planned Programs Subtotals		3.796	3.461			
				2.736			
C. Other Program Funding Summary (\$ in Millions)							
N/A							
Remarks							
D. Acquisition Strategy							
N/A							

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0605702A / Meteorological Support to RDT&E Activities							
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	9.495	6.233	6.488	-	6.488	6.694	6.756	7.208	7.349	0.000	50.223
128: Meteorological Support To RDT&E Activities	-	9.495	6.233	6.488	-	6.488	6.694	6.756	7.208	7.349	0.000	50.223

A. Mission Description and Budget Item Justification

This Program Element (PE) provides meteorological support to research, development, test, and evaluation (RDTE) activities and provides standard and specialized weather forecasts and data to satisfy Army/Department of Defense (DoD) RDTE test requirements for modern weaponry. Types of support include: (1) unique atmospheric analysis and sampling to include atmospheric transmittance, extinction, optical scintillation, infrared temperature, aerosol/smoke cloud dispersion characteristics, and ballistic meteorological measurements; (2) test event forecasting to include prediction of sound propagation for ballistic firing tests, specialized prediction of light levels and target-to-background measurements, and predictions for electro-optical testing and ballistic artillery/mortar firing; and (3) advisory and warning products such as go/no-go test recommendations for ballistic and atmospheric probe missiles, smoke/obscurant tests, hazard predictions for chemical agent munitions disposal, monitoring dispersion of simulant clouds for chemical/biological detector tests, simulated nuclear blasts, and weather warnings for test range safety. This PE provides technical weather support to Army and Joint Program Executive Officers (PEOs), Project Managers (PMs), and the Army test ranges and sites at: White Sands Test Center (WSTC), White Sands Missile Range, New Mexico; Electronic Proving Ground (EPG), Fort Huachuca, Arizona; West Desert Test Center (WDTC), Dugway Proving Ground, Utah; Aberdeen Test Center (ATC), Aberdeen Proving Ground, Maryland; Redstone Test Center (RTC), Redstone Arsenal, Alabama; Yuma Test Center (YTC), Yuma Proving Ground, Arizona (including the Cold Regions Test Center (CRTC), Fort Greely, Alaska); Operational Test Command (OTC), Fort Hood, Texas and Fort Bragg, North Carolina. This PE develops methodologies and acquires instrumentation and systems that allow meteorological teams to support current and future Army/DoD RDTE requirements. It finances indirect meteorological support operating costs not billable to customers along with replacement/upgrade of meteorological instrumentation and support systems. Direct costs for meteorological support services are not funded by this PE, but are borne by the customer (i.e., materiel/weapons developers and project/product managers) in accordance with DoD Directive 7000.14R (Department of Defense Financial Management Regulations). This PE enables more effective test scheduling and execution, and is essential to the accomplishment of the Army's developmental and operational test mission in that precise weather modeling and measurements directly influence test item performance and quantify test item weather dependencies and vulnerabilities.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army					Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)				
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support	PE 0605702A / Meteorological Support to RDT&E Activities				
B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	9.759	6.233	6.420	-	6.420
Current President's Budget	9.495	6.233	6.488	-	6.488
Total Adjustments	-0.264	0.000	0.068	-	0.068
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.264	-			
• Adjustments to Budget Years	-	-	0.068	-	0.068

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 6					PE 0605702A / Meteorological Support to RDT&E Activities				128 / Meteorological Support To RDT&E Activities				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
128: Meteorological Support To RDT&E Activities	-	9.495	6.233	6.488	-	6.488	6.694	6.756	7.208	7.349	0.000	50.223	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project provides meteorological support to research, development, test, and evaluation (RDTE) activities and provides standard and specialized weather forecasts and data to satisfy Army/Department of Defense (DoD) RDTE test requirements for modern weaponry. Types of support include: (1) unique atmospheric analysis and sampling to include atmospheric transmittance, extinction, optical scintillation, infrared temperature, aerosol/smoke cloud dispersion characteristics, and ballistic meteorological measurements; (2) test event forecasting to include prediction of sound propagation for ballistic firing tests, specialized prediction of light levels and target-to-background measurements, and predictions for electro-optical testing and ballistic artillery/mortar firing; and (3) advisory and warning products such as go/no-go test recommendations for ballistic and atmospheric probe missiles, smoke/obscurant tests, hazard predictions for chemical agent munitions disposal, monitoring dispersion of simulant clouds for chemical/biological detector tests, simulated nuclear blasts, and weather warnings for test range safety. This Project provides technical weather support to Army and Joint Program Executive Officers (PEOs), Project Managers (PMs), and the Army test ranges and sites at: White Sands Test Center (WSTC), White Sands Missile Range, New Mexico; Electronic Proving Ground (EPG), Fort Huachuca, Arizona; West Desert Test Center (WDTC), Dugway Proving Ground, Utah; Aberdeen Test Center (ATC), Aberdeen Proving Ground, Maryland; Redstone Test Center (RTC), Redstone Arsenal, Alabama; Yuma Test Center (YTC), Yuma Proving Ground, Arizona (including the Cold Regions Test Center (CRT), Fort Greely, Alaska); Operational Test Command (OTC), Fort Hood, Texas and Fort Bragg, North Carolina. This PE develops methodologies and acquires instrumentation and systems that allow meteorological teams to support current and future Army/DoD RDTE requirements. It finances indirect meteorological support operating costs not billable to customers along with replacement/ upgrade of meteorological instrumentation and support systems. Direct costs for meteorological support services are not funded by this PE, but are borne by the customer (i.e., materiel/weapons developers and project/product managers) in accordance with DoD Directive 7000.14R (Department of Defense Financial Management Regulations). This PE enables more effective test scheduling and execution, and is essential to the accomplishment of the Army's developmental and operational test mission in that precise weather modeling and measurements directly influence test item performance and quantify test item weather dependencies and vulnerabilities.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Title: Civilian Pay and Support Costs	2.067	2.078	2.160
Description: Funding related to Civilian Pay and associated indirect costs for meteorological support.			

FY 2020 Plans:
Will provide indirect costs (personnel salaries) for generating weather forecasts, severe weather warnings and advisories; staff meteorological services; and atmospheric measurements in support of Army/DoD tests and projects at eight Army test sites and alternate test sites as required. Will provide program management for meteorological support to the Army research, development, test and evaluation community and technical review/assistance to ranges and meteorological support teams. Will

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 6	PE 0605702A / Meteorological Support to RDT&E Activities	128 / Meteorological Support To RDT&E Activities	
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
provide technical meteorological support to the Army RDTE community including collaboration between Army meteorologists and the National Center for Atmospheric Research (NCAR) toward improvements to the Four Dimensional Weather System (4DWX) and associated system administration.			
FY 2021 Plans: Will provide indirect costs (personnel salaries) for generating weather forecasts, severe weather warnings and advisories; staff meteorological services; and atmospheric measurements in support of Army/DoD tests and projects at eight Army test sites and alternate test sites as required. Will provide program management for meteorological support to the Army RDTE community and technical review/assistance to ranges and meteorological support teams. Will provide technical meteorological support to the Army RDTE community including collaboration between Army meteorologists and NCAR toward improvements to the 4DWX System and associated system administration.			
FY 2020 to FY 2021 Increase/Decrease Statement: Minor change due inflation for civilian pay and routine program adjustments.			
Title: Four Dimensional Weather System and Instrumentation Description: Provides funding for meteorological instrumentation and technology to support RDTE activities at Army test sites. Includes funding for sustainment and enhancement of the 4DWX system, an advanced meteorological support system that provides high-resolution weather forecasts and analyzes. The 4DWX analyzes and forecasts the 3-dimensional structure of the atmosphere over time (4th dimension) and is used in test planning, conduct, and forensic analyses.	7.425	4.001	4.328
FY 2020 Plans: Will continue 4DWX system sustainment and modernization to improve forecast accuracy in support of Army RDTE mission requirements, including development of a full-grid climatology using 4DWX final-analysis data, and further development of probabilistic modeling; improved data assimilation procedures, and configuration of 4DWX to optimize test range-specific accuracy. Instrumentation funding will be used to continue a multi-year effort to replace/upgrade obsolete instrumentation, including upper-air sounding systems, surface atmospheric meteorological system, and radar wind profilers at several test centers.			
FY 2021 Plans: Will continue 4DWX system sustainment and modernization to improve forecast accuracy in support of Army RDTE mission requirements, including development of a full-grid climatology using 4DWX final-analysis data, and further development of probabilistic modeling; improved data assimilation procedures, and configuration of 4DWX to optimize test range-specific			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605702A / Meteorological Support to RDT&E Activities	Project (Number/Name) 128 / Meteorological Support To RDT&E Activities		
B. Accomplishments/Planned Programs (\$ in Millions) accuracy. Instrumentation funding will be used to continue a multi-year effort to replace/upgrade obsolete instrumentation, including upper-air sounding systems, surface atmospheric meteorological system, and radar wind profilers at several ATEC sites. FY 2020 to FY 2021 Increase/Decrease Statement: Program funding aligns 4DWX and Instrumentation requirements with Army modernization priorities in support of the National Defense Strategy. Title: FY 2018 National Defense Authorization Act (NDAA) Section 825 Major Defense Acquisition Program (MDAP) Cost Overrun Description: FY 2018 NDAA Section 825 MDAP Cost Overrun		FY 2019	FY 2020	FY 2021
Title: FY 2020 SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC ?638		-	0.003	-
 FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638 FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638			0.154	-
Accomplishments/Planned Programs Subtotals		9.495	6.233	6.488
C. Other Program Funding Summary (\$ in Millions) N/A Remarks				
D. Acquisition Strategy N/A				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0605706A / Materiel Systems Analysis							
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	21.043	21.342	21.859	-	21.859	21.824	21.810	22.941	23.384	0.000	154.203
541: Materiel Sys Analysis	-	21.043	21.342	21.859	-	21.859	21.824	21.810	22.941	23.384	0.000	154.203

A. Mission Description and Budget Item Justification

This Program Element (PE) resources the Combat Capabilities Development Command (CCDC) Data and Analysis Center (DAC) to conduct systems and engineering analyses to support Future Force Modernization Enterprise decisions in technology, materiel acquisition, and the design, development, fielding and sustainment of Army materiel systems. The analysis products funded by this PE are leveraged to support Materiel Acquisition decisions and influence the design, development, and sustainment of Army weapon/materiel systems in support of the current and future force in the areas of Long Range Precision Fires, Next Generation Combat Vehicles, Future Vehicle Lift, Network/Command, Control, Communications and Intelligence, Air and Missile Defense, Soldier Lethality and other Army Priority efforts.

As the Army's center for materiel systems analysis, the CCDC DAC provides the technical capability to support Army and DoD decision makers throughout the entire acquisition process in responding to analytical requirements across the full spectrum of materiel. The DAC's unique in-house, consistent, integrated analytical capability is a critical asset that provides Army leadership with timely, independent, unbiased, reliable, and high quality analysis to support complex decisions required for Current Operations and the development of the Future Force. The DAC's integrated set of skills and tools are focused on the highest Army Priorities with a core mission to deliver objective analysis, experimentation, and data across the entire life cycle to ensure Readiness today and a more lethal Future Force tomorrow.

This PE develops and certifies system level performance and effectiveness data across a broad range of capabilities such as target acquisition, probability of inflicting catastrophic damage, personnel and vehicle survivability, mobility, network, system reliability, and several additional capability areas used in Army studies. The PE funds the development of item-level performance methodology, and Models and Simulations (M&S) for the current and future operational environments and emerging threats. The M&S capabilities support the development, linkage and accreditation of live, virtual, and constructive simulations, and provide unique tools that support systems analysis of individual systems and the combined arms environment. This M&S infrastructure provides a hierarchical modeling framework that is unique to the DAC and allows for a comprehensive performance and effectiveness analysis and prediction capability that can be utilized to support trade-off and investment decisions prior to extensive and expensive hardware testing of proposed systems/technologies.

This PE funds the Center for Reliability Growth (CRG), to develop critical tools, methodologies, policies, guidance and educational materials required to help acquisition programs achieve required reliability during the acquisition process. The CRG develops and applies engineering approaches to assess the reliability of Army materiel and provides recommendations on ways to improve reliability, thereby, reducing logistics footprints and life cycle costs, and extending failure-free periods for materiel. The CRG has developed an integrated set of skills and tools focused on its core competencies to be responsive in delivering objective data and analysis across the entire life cycle to ensure Readiness today and a more lethal future force tomorrow.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army					Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name) PE 0605706A / Materiel Systems Analysis				
B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	21.223	21.342	21.631	-	21.631
Current President's Budget	21.043	21.342	21.859	-	21.859
Total Adjustments	-0.180	0.000	0.228	-	0.228
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.180	-			
• Adjustments to Budget Years	-	-	0.228	-	0.228

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army										Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605706A / Materiel Systems Analysis				Project (Number/Name) 541 / Materiel Sys Analysis			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
541: Materiel Sys Analysis	-	21.043	21.342	21.859	-	21.859	21.824	21.810	22.941	23.384	0.000	154.203
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	

A. Mission Description and Budget Item Justification

This Program Element (PE) resources the Combat Capabilities Development Command (CCDC) Data and Analysis Center (DAC) to conduct systems and engineering analyses to support Future Force Modernization Enterprise decisions in technology, materiel acquisition, and the design, development, fielding and sustainment of Army materiel systems. The analysis products funded by this PE are leveraged to support Materiel Acquisition decisions and influence the design, development, and sustainment of Army weapon/materiel systems in support of the current and future force in the areas of Long Range Precision Fires, Next Generation Combat Vehicles, Future Vehicle Lift, Network/Command, Control, Communications and Intelligence, Air and Missile Defense, Soldier Lethality and other Army Priority efforts.

As the Army's center for materiel systems analysis, the CCDC DAC provides the technical capability to support Army and DoD decision makers throughout the entire acquisition process in responding to analytical requirements across the full spectrum of materiel. The DAC's unique in-house, consistent, integrated analytical capability is a critical asset that provides Army leadership with timely, independent, unbiased, reliable, and high quality analysis to support complex decisions required for Current Operations and the development of the Future Force. The DAC's integrated set of skills and tools are focused on the highest Army Priorities with a core mission to deliver objective analysis, experimentation, and data across the entire life cycle to ensure Readiness today and a more lethal Future Force tomorrow.

This PE develops and certifies system level performance and effectiveness data across a broad range of capabilities such as target acquisition, probability of inflicting catastrophic damage, personnel and vehicle survivability, mobility, network, system reliability, and several additional capability areas used in Army studies. The PE funds the development of item-level performance methodology, and Models and Simulations (M&S) for the current and future operational environments and emerging threats. The M&S capabilities support the development, linkage and accreditation of live, virtual, and constructive simulations, and provide unique tools that support systems analysis of individual systems and the combined arms environment. This M&S infrastructure provides a hierarchical modeling framework that is unique to the DAC and allows for a comprehensive performance and effectiveness analysis and prediction capability that can be utilized to support trade-off and investment decisions prior to extensive and expensive hardware testing of proposed systems/technologies.

This PE funds the Center for Reliability Growth (CRG), to develop critical tools, methodologies, policies, guidance and educational materials required to help acquisition programs achieve required reliability during the acquisition process. The CRG develops and applies engineering approaches to assess the reliability of Army materiel and provides recommendations on ways to improve reliability, thereby, reducing logistics footprints and life cycle costs, and extending failure-free periods for materiel. The CRG has developed an integrated set of skills and tools focused on its core competencies to be responsive in delivering objective data and analysis across the entire life cycle to ensure Readiness today and a more lethal future force tomorrow.

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

Title: Materiel Systems Analysis

FY 2019	FY 2020	FY 2021
21.041	21.221	21.859

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605706A / Materiel Systems Analysis	Project (Number/Name) 541 / Materiel Sys Analysis	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019 FY 2020 FY 2021
<p>Description: This activity provides for systems and engineering analyses to support the entire Future Force Modernization Enterprise decisions in technology, materiel acquisition, and the design, development, fielding and sustainment of Army materiel systems; the development of system level performance and effectiveness data and item-level performance methodology, and models and simulations; and the development of critical tools, methodologies, policies and guidance as the Center for Reliability Growth to improve reliability, extend failure-free periods, and reduce support costs.</p>			
<p>FY 2020 Plans: AMSAA will continue to provide critical analyses and data to support key Army acquisition milestone decisions and reviews. AMSAA will continue to provide critical analytical support to the Army Cross Functional Teams (CFT), and to support Army conceptual and developmental all Acquisition Category programs including but not limited to: Family of Unmanned Aircraft Systems, Cyberspace Situational Understanding, Future Vertical Lift, Optionally Manned Fighting Vehicle, Future M1 Replacement, Big Data Initiatives, and Cyber Electromagnetic Activities/Electronic Warfare. AMSAA will further develop and enhance Cyber, Air and Missile Defense, and life cycle cost analytic capabilities to ensure more robust analysis of potential capabilities to properly equip the Current and Future Force. Additionally, AMSAA will ensure modeling and simulation readiness by properly updating and sustaining key analytic tools and models. AMSAA will continue to support a variety of trade-space efforts and analyses in support of the Army Secretariat and Staff. AMSAA will also provide analytical support to modify Test and Evaluation (T&E) planning efforts, reduce testing through the use of modeling and simulation, and provide software analysis and reliability capabilities to support T&E. AMSAA will conduct follow-on studies for major Army programs undergoing engineering change proposals and continue to provide essential certified weapons system performance data for all major Army studies. AMSAAs technical work program relating to Analysis of Alternatives (AoA?s) (providing analytic input and certified data, as well as leading specified AoA?s), providing direct analytical support to the CFT?s, Business Case Analyses, and Cost Benefit Analyses and Risk Assessments will continue at a high level (similar to fiscal year (FY) 2018 and FY2019). AMSAA will continue efforts in support of the Army Center for Reliability Growth, as well as efforts on current operations related tasks, analyses, and model enhancements. Moreover, AMSAA will continue to develop and enhance its comprehensive set of system performance data and essential verified and validated item/system level methodologies, tools, and models and simulations to conduct materiel system performance analysis. This will insure accurate and up-to-date analytical products are provided across the full spectrum of Army capability/ commodity areas. Overall, AMSAA?s analysis capabilities and products will enable Senior Leaders to properly shape and influence acquisition policy, procedures, and materiel solutions and increase readiness for our Current and Future Force. AMSAA?s inclusion as one of the central members of the Futures and Modernization Analysis Center (FMAC)/Army Futures Command (AFC) illustrates the critical contributions the organization has and continues to make in supporting Acquisition Modernization decisions.</p>			
<p>FY 2021 Plans: Will continue to conduct materiel systems analysis through the development and enhancement of comprehensive sets of system performance data and essential verified and validated item/system level methodologies, tools, and models and simulations.</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605706A / Materiel Systems Analysis	Project (Number/Name) 541 / Materiel Sys Analysis		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
<p>Will continue to provide analytical support to Test and Evaluation (T&E) planning, to reduce testing through the use of modeling and simulation, and to provide software analysis and reliability capabilities to support T&E. Will conduct follow-on studies for major Army programs undergoing engineering change proposals and continue to provide essential certified weapons system performance data for all major Army studies. Will continue to provide critical tools, policies and educational materials as the Army's Center for Reliability Growth to improve system reliability throughout the acquisition process. Will continue to provide extensive analytical support to the Cross Functional Teams (CFTs) to include Analysis of Alternatives (AoA's), system cost/ performance tradeoffs, early technology trade-offs, weapons/systems mix analyses, system Technical and Schedule risk assessments, business case analyses, cost benefit analyses, requirements analyses, technology insertion studies, reliability growth studies, and Physics of Failure (PoF) analyses. Will conduct systems analysis and assessments in support of multiple efforts including Mobile-Short-Range Air Defense (M-SHORAD), Future Vehicle Lift (FVL), Assured-Positioning, Navigation and Timing (A-PNT), Network, Next Generation Combat Vehicle Quarterback, Directed Energy systems, Autonomous Vehicles, Artificial Intelligence, Multi-Domain Operations, Active Protection Systems, and Electronic Warfare, and Army Futures Command/ Combat Capabilities Development Command's highest priority platforms, technologies and weapon systems. For systems analyzed, will provide relevant data and results to materiel developers and senior decision makers to support acquisition decisions.</p>				
FY 2020 to FY 2021 Increase/Decrease Statement: Increase due to economic adjustments				
Title: FY 2018 NDAA SEC 825 MDAP Cost Overrun		0.002	-	-
Description: FY 2018 NDAA SEC 825 MDAP Cost Overrun				
Title: FY 2020 SBIR/STTR Transfer		-	0.121	-
Description: Funding transferred in accordance with Title 15 USC 638				
FY 2020 Plans: Funding transferred in accordance with Title 15 USC 638				
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638				
Accomplishments/Planned Programs Subtotals		21.043	21.342	21.859
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army	Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605706A / <i>Materiel Systems Analysis</i>	Project (Number/Name) 541 / <i>Materiel Sys Analysis</i>
D. Acquisition Strategy N/A		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0605709A / Exploitation of Foreign Items							
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	15.026	11.168	7.936	1.000	8.936	12.801	13.108	13.407	15.803	0.000	90.249
C28: Acq/Exploit Threat Items (MIP)	-	15.026	11.168	7.936	1.000	8.936	12.801	13.108	13.407	15.803	0.000	90.249
A. Mission Description and Budget Item Justification												
This Program Element (PE) provides for the acquisition, exploitation, and inventory of foreign ground materiel with potential advanced technology threats to United States (U.S.) systems, as well as emerging and destructive threats such as cyber vulnerabilities, biometric systems, and evolving improvised explosive devices. The primary aim of the PE is to maximize the efficiency of research and development for force and materiel development by reducing the uncertainties associated with these threats. The PE also answers scientific and technical intelligence requirements, provides materiel for realistic testing and training, and aids in the development of countermeasures to threat systems, materiel, and technologies. Operations have increased the amount of captured threat materiel that require immediate exploitation to develop countermeasures and force protection measures for U.S. forces. Acquisition and exploitation are executed according to Army Foreign Materiel Program (FMP) Plan prioritization and with the approval of the Army Deputy Chief of Staff for Intelligence (G2).												
B. Program Change Summary (\$ in Millions)				FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total				
Previous President's Budget				13.026	11.168	11.441	-	11.441				
Current President's Budget				15.026	11.168	7.936	1.000	8.936				
Total Adjustments				2.000	0.000	-3.505	1.000	-2.505				
<ul style="list-style-type: none"> • Congressional General Reductions • Congressional Directed Reductions • Congressional Rescissions • Congressional Adds • Congressional Directed Transfers • Reprogrammings • SBIR/STTR Transfer • Adjustments to Budget Years 				-	-	-	-	-				
				2.000	-	-	-	-				
				-	-	-3.505	1.000	-2.505				
Change Summary Explanation												
The FY19 reprogramming increase of \$2.000 million was to produce a physics based mobility model for both foreign & US AFVs which will accurately predict mobility performance on complex terrain conditions and enable integrated weapon system capability. This model will provide a foreign AFV mobility planning tool to reduce decision maker uncertainty about threat vehicle mobility corridors in support of specific OPLANS. This is in support of requirements submitted by Army Futures Command, US Army Material Command, US European Command, & US Army Training & Doctrine Command.												
The FY21 decrease was due to a recapitalizing of resources for acquisition.												

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605709A / Exploitation of Foreign Items				Project (Number/Name) C28 / Acq/Exploit Threat Items (MIP)				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
C28: Acq/Exploit Threat Items (MIP)	-	15.026	11.168	7.936	1.000	8.936	12.801	13.108	13.407	15.803	0.000	90.249	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-	
A. Mission Description and Budget Item Justification													
This Project provides for the acquisition, exploitation, and inventory of foreign ground materiel with potential advanced technology threats to United States (U.S.) systems, as well as emerging and destructive threats. The primary aim of the Project is to maximize the efficiency of research and development for force and materiel development by reducing the uncertainties associated with these threats. The Project also answers scientific and technical intelligence requirements, provides materiel for realistic testing and training, and aids in the development of countermeasures to threat systems, materiel, and technologies. Operations have increased the amount of captured threat materiel that require immediate exploitation to develop countermeasures and force protection measures for U.S. forces. Acquisition and exploitation are executed according to Army Foreign Materiel Program (FMP) Plan prioritization and with the approval of the G2.													
B. Accomplishments/Planned Programs (\$ in Millions)													
Title: Army Foreign Materiel Program (FMP) Acquisition													
Description: This effort provides for the acquisition of foreign ground materiel with potential advanced technology threats to U.S. systems, as well as emerging and destructive threats. The primary aim of the effort is to maximize the efficiency of research and development for force and materiel development by reducing the uncertainties associated with these threats. The effort also answers scientific and technical intelligence requirements, provides materiel for realistic testing and training, and aids in the development of countermeasures to threat systems, materiel, and technologies. Operations have increased the amount of captured threat materiel that require immediate exploitation to develop countermeasures and force protection measures for US forces. Acquisition and exploitation are executed according to Army FMP Plan prioritization and with the approval of the G2.													
FY 2020 Plans: Will conduct Foreign Materiel Acquisition of threat related foreign ground materiel systems and state of the art technologies of military significance.													
FY 2021 Base Plans: Will conduct Foreign Materiel Acquisition of threat related foreign ground materiel systems and state of the art technologies of military significance.													
FY 2020 to FY 2021 Increase/Decrease Statement:													

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army					Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605709A / Exploitation of Foreign Items	Project (Number/Name) C28 / Acq/Exploit Threat Items (MIP)				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
The decrease was due to a recapitalizing of resources for acquisition.						
Title: Army Foreign Materiel Program (FMP) Exploitation		10.728	7.483	5.308	1.000	6.308
Description: This effort provides for the exploitation and inventory of foreign ground materiel with potential advanced technology threats to U.S. systems, as well as emerging and destructive threats such as cyber vulnerabilities, biometric systems, and evolving improvised explosive devices. The primary aim of the effort is to maximize the efficiency of research and development for force and materiel development by reducing the uncertainties associated with these threats. The effort also answers scientific and technical intelligence requirements, provides materiel for realistic testing and training, and aids in the development of countermeasures to threat systems, materiel, and technologies. Operations have increased the amount of captured threat materiel that require immediate exploitation to develop countermeasures and force protection measures for US forces. Acquisition and exploitation are executed according to Army FMP Plan prioritization and with the approval of the G2.						
FY 2020 Plans: Will conduct Foreign Materiel Exploitation of threat related foreign ground materiel systems and state of the art technologies of military significance.						
FY 2021 Base Plans: Will conduct Foreign Materiel Exploitation of threat related foreign ground materiel systems and state of the art technologies of military significance.						
FY 2021 OCO Plans: Will conduct Foreign Materiel Exploitation of battlefield acquired FM.						
FY 2020 to FY 2021 Increase/Decrease Statement: The decrease was due to a recapitalizing of resources for acquisition.						
Accomplishments/Planned Programs Subtotals		15.026	11.168	7.936	1.000	8.936
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
N/A						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0605712A / Support of Operational Testing							
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	52.139	52.723	54.470	-	54.470	55.444	55.513	56.726	57.822	0.000	384.837
001: ATEC Joint Tests And Follow-On Test & Eval	-	0.285	0.292	0.303	-	0.303	0.309	0.316	0.322	0.329	0.000	2.156
V02: ATEC Activities	-	51.854	52.431	54.167	-	54.167	55.135	55.197	56.404	57.493	0.000	382.681
A. Mission Description and Budget Item Justification												
This Program Element (PE) provides resources to the Army Test and Evaluation Command (ATEC) to operate the Army Joint Test Element (JTE) and the Army's Operational Test Command (OTC). JTE examines Joint Service, Combatant Command (COCOM) and Department of Defense (DoD) agencies' mission gaps, tactics and doctrine, resulting in the development of Tactics, Techniques and Procedures (TTP), Concept of Operations (CONOPS) and assessment documents. Products are developed through operational non-materiel solutions to urgent, specific, Joint Warfighter problems. OTC conducts independent operational tests that provide significant data to Army decision-makers on key Army systems and concepts. This PE finances recurring costs for OTC that are essential for conducting realistic and continuous testing in the critical areas of equipment, doctrine, force design and training. These recurring costs include civilian pay, requirements for test support contracts, temporary duty, training, supplies and equipment.												
B. Program Change Summary (\$ in Millions)				FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total				
Previous President's Budget				52.705	52.723	53.898	-	53.898				
Current President's Budget				52.139	52.723	54.470	-	54.470				
Total Adjustments				-0.566	0.000	0.572	-	0.572				
<ul style="list-style-type: none"> • Congressional General Reductions • Congressional Directed Reductions • Congressional Rescissions • Congressional Adds • Congressional Directed Transfers • Reprogrammings • SBIR/STTR Transfer • Adjustments to Budget Years 				-	-	-	-	-				
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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 6					PE 0605712A / Support of Operational Testing				001 / ATEC Joint Tests And Follow-On Test & Eval				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
001: ATEC Joint Tests And Follow-On Test & Eval	-	0.285	0.292	0.303	-	0.303	0.309	0.316	0.322	0.329	0.000	2.156	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project provides funding for the Army Joint Test Element (JTE) which examines Joint Service, Combatant Command (COCOM) and Department of Defense (DoD) agencies' mission gaps, tactics and doctrine, resulting in the development of Tactics, Techniques and Procedures (TTP), Concept of Operations (CONOPS) and assessment documents. Products are developed through operational non-materiel solutions to urgent, specific, Joint Warfighter problems. The JTE coordinates and develops nominations for Quick Reaction Tests (QRTs) and Joint Feasibility Studies (JFS); serves as the Operational Test Agency (OTA) for Army-led QRTs; and coordinates resources to support Joint Feasibility Studies and chartered Joint Tests (JT) under the Joint Test Unit (JTU) assigned to the Army test and Evaluation Command (ATEC) as the joint OTA. Mission support for JTE includes supporting two Joint Tests under the Joint Test program, and assigned special projects. ATEC provides military resource support to Nellis Air Force Base, Suffolk VA, United States Pacific Command (USPACOM) J81 (Hawaii), and Marine Corps Warfighter Laboratory (Quantico, VA) with Officer and Non-Commissioned Officer (NCO) support. JTE supports Joint Tests until these Office of the Secretary of Defense (OSD) chartered projects are completed and transitioned to the respective Sponsoring COCOM.

B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019	FY 2020	FY 2021
Title: Army Joint Test Element (JTE) Management Support			0.285	0.292	0.303
Description: Funds the civilian salaries and related non-labor requirements that support the JTE.					
FY 2020 Plans: Will fund civilian labor and non-labor requirements such as supplies and travel in support of JTE initiatives, program support from remote JT stations, and COCOM engagements.					
FY 2021 Plans: Will continue to fund civilian labor and non-labor requirements such as supplies and travel in support of JTE initiatives, program support from remote JT stations, and COCOM engagements.					
FY 2020 to FY 2021 Increase/Decrease Statement: Minor change due to routine program adjustments.					
Accomplishments/Planned Programs Subtotals			0.285	0.292	0.303

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

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605712A / <i>Support of Operational Testing</i>	Project (Number/Name) 001 / <i>ATEC Joint Tests And Follow-On Test & Eval</i>
C. Other Program Funding Summary (\$ in Millions)		
Remarks		
D. Acquisition Strategy N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605712A / Support of Operational Testing				Project (Number/Name) V02 / ATEC Activities			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
V02: ATEC Activities	-	51.854	52.431	54.167	-	54.167	55.135	55.197	56.404	57.493	0.000	382.681
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project provides funding to ATEC to operate the Operational Test Command (OTC) which conducts independent operational tests that provide significant data to Army decision makers on key systems in support of the Army's modernization priorities. These operational tests are required by public law (Title 10 USC 2399). This Project finances recurring costs for OTC that are essential to conduct realistic and continuous testing in the critical areas of equipment, doctrine, force design and training. These recurring costs include civilian pay, requirements for test support contracts, temporary duty, training, supplies and equipment.

OTC consists of four forward Test Directorates (Airborne and Special Operations Test Directorate, Fort Bragg, North Carolina; Air and Missile Defense Test Directorate, Fort Bliss, Texas; Fires Support Test Directorate, Fort Sill, Oklahoma; and the Intelligence Electronic Warfare Test Directorate, Fort Huachuca, Arizona) together with four other Test Directorates (Aviation; Maneuver; Mission Command; Maneuver Support and Sustainment) at Fort Hood, Texas. These activities support the development and fielding cycle of all Army acquisition programs including rapid fielding initiatives in support of the Army's modernization priorities. The primary mission of these test directorates is to perform detailed planning, execution, and reporting of Customer Tests, Early User Tests, Limited User Tests (LUT), Initial Operational Test and Evaluation (IOTE), and Follow-On Operational Tests (FOT). OTC also supports Army Futures Command's Soldier Touch Points and other early assessments of potential new systems the Army may acquire.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Title: Operational Test Command Civilian Pay	41.100	40.895	42.001
Description: This funding supports the cost of civilian labor for OTC Program Budget Guidance (PBG) authorizations.			
FY 2020 Plans: Support the cost of civilian labor for OTC PBG authorizations.			
FY 2021 Plans: Will continue to support the costs of civilian labor for OTC PBG authorizations.			
FY 2020 to FY 2021 Increase/Decrease Statement: Minor change due to routine program adjustments.			
Title: FY 2018 National Defense Authorization Act (NDAA) Section 825 Major Defense Acquisition Program (MDAP) Cost Overrun	0.005	-	-
Description: FY 2018 NDAA Section 825 MDAP Cost Overrun			
Title: Operational Test Command Operations Support	10.749	11.047	12.166

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605712A / Support of Operational Testing	Project (Number/Name) V02 / ATEC Activities		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
Description: OTC operational costs including: support contracts, temporary duty, training, supplies and equipment.				
FY 2020 Plans: Support operational costs including support contracts, temporary duty, training, supplies and equipment.				
FY 2021 Plans: Continue to support operational costs including support contracts, temporary duty, training, supplies and equipment.				
FY 2020 to FY 2021 Increase/Decrease Statement: Minor change due to routine program adjustments.				
Title: FY 2020 SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC ?638				0.489
FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638				-
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638				
Accomplishments/Planned Programs Subtotals				51.854 52.431 54.167
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
N/A				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0605716A / Army Evaluation Center							
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	56.532	60.815	63.141	-	63.141	65.217	61.392	64.966	66.221	0.000	438.284
302: Army Evaluation Center	-	56.532	60.815	63.141	-	63.141	65.217	61.392	64.966	66.221	0.000	438.284

A. Mission Description and Budget Item Justification

This Program Element (PE) provides the resources to operate the Army Evaluation Center (AEC), the Army's independent evaluator for Army Futures Command (AFC) Cross Functional Team (CFT) efforts and all other Army programs (currently over 700 programs in total). AEC is the lead agent to plan, direct and evaluate all required program testing and is the unbiased, independent authority for reporting on system progress. AEC is the focal point in test strategy development, system safety verification, and data analyses from early developmental consumer tests through operational tests. AEC develops Critical Operational Issues and Criteria (COIC) in conjunction with AFC to narrow the focus of testing to what is essential. AEC reviews system requirements to ensure they do not drive unnecessary testing. AEC provides critical independent assessments on the effectiveness, suitability, and survivability to include cyber and electronic warfare; safety of materiel solutions; and viability of emerging technologies and engineering change proposals in order to support major acquisition/fielding decisions including but not limited to acquisition milestones, materiel changes, and materiel release.

AEC is responsible for all assigned developmental and independent operational evaluation of Army materiel, information and acquisition systems, an inherently governmental mission. This core evaluation mission cannot be reimbursable. AEC must remain independent from the development community. AEC assists the Chief of Staff of the Army decision making process by supporting Army Requirements Oversight Council (AROC) processes as well as supporting the AFC through the CFT concept. AEC evaluates operational effectiveness by determining if the system provides intended benefits to the Force. AEC determines impacts to readiness through Human Systems Integration (HSI), Unit Systems Integration (USI), and Army Systems Integration (ASI), as well as doctrine, organization, training, materiel, leadership and education, personnel, facilities and policy (DOTMLPF-P) impacts, AEC evaluates ballistics survivability and lethality, adversarial assessments/threat computer network operations, cooperative vulnerability and penetration assessments (CVPA), and electronic warfare (EW) (attack, protection, and support) in support of the National Defense Authorization Act (NDAA) 2016 Section 1647, establishment of Cybersecurity and Electromagnetic Effects (CEMA). AEC manages, plans, and executes Information Assurance (IA) operational assessments during annual Combatant Command and Army Service exercises in support of the congressionally mandated Office of the Secretary of Defense Director, Operational Test and Evaluation (OSD DOT&E) assessment, and performs the operational test agency (OTA) duties for the Ballistic Missile Defense System.

This PE funds direct civilian labor and minimum non-labor requirements to include: Temporary Duty (TDY), personnel training, career development, supplies and equipment, hardware, software, and other external Other Government Agency (OGA) support as well as methodology development required to evaluate emerging technologies and instrumentation requirements.

AEC consists of seven directorates (Aviation-Fires Evaluation Directorate, Ballistic Missile Defense (BMD) Evaluation Directorate (funded by the Missile Defense Agency (MDA)), Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) Evaluation Directorate, Integrated Suitability & Methodology Directorate, Mounted Systems Evaluation Directorate, Soldier & Support System Evaluation Directorate and Survivability Evaluation Directorate) and a lean headquarters element as AEC receives staff services from the Army Test and Evaluation Command Headquarters (ATEC HQ). The AEC primary competencies are:

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army					Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)				
2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	PE 0605716A / <i>Army Evaluation Center</i>				
identify what decision makers need to know; plan and direct test and evaluation strategies; evaluate operational effectiveness, suitability, survivability and safety; and provide senior leadership unbiased advice on Army programs.					
B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	57.039	60.815	62.482	-	62.482
Current President's Budget	56.532	60.815	63.141	-	63.141
Total Adjustments	-0.507	0.000	0.659	-	0.659
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.507	-			
• Adjustments to Budget Years	-	-	0.659	-	0.659

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army										Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605716A / Army Evaluation Center				Project (Number/Name) 302 / Army Evaluation Center			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
302: Army Evaluation Center	-	56.532	60.815	63.141	-	63.141	65.217	61.392	64.966	66.221	0.000	438.284
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	

A. Mission Description and Budget Item Justification

This Project provides the resources to operate the Army Evaluation Center (AEC), the Army's independent evaluator for Army Futures Command (AFC) Cross Functional Team (CFT) efforts and all other Army programs (currently over 700 programs in total). AEC is the lead agent to plan, direct, and evaluate all required program testing and is the unbiased and independent authority for reporting on system progress. AEC is the focal point in test strategy development, system safety verification, and data analyses from early developmental consumer tests through operational tests. AEC develops Critical Operational Issues and Criteria (COIC) in conjunction with AFC to narrow the focus of testing to what is essential. AEC reviews system requirements to ensure they do not drive unnecessary testing. AEC provides critical independent assessments on the effectiveness, suitability, and survivability to include cyber and electronic warfare; safety of materiel solutions; and viability of emerging technologies and engineering change proposals in order to support major acquisition/fielding decisions including but not limited to acquisition milestones, materiel changes, and materiel releases.

AEC is responsible for all assigned developmental and independent operational evaluation of Army materiel, information and acquisition systems, an inherently governmental mission. This core evaluation mission cannot be reimbursable. AEC must remain independent from the development community. AEC assists the Chief of Staff of the Army decision making process by supporting Army Requirements Oversight Council (AROC) processes as well as supporting the AFC through the CFT concept. AEC evaluates operational effectiveness by determining if the system provides intended benefits to the Force. AEC determines impacts to readiness through Human Systems Integration (HSI), Unit Systems Integration (USI), and Army Systems Integration (ASI), as well as doctrine, organization, training, materiel, leadership and education, personnel, facilities and policy (DOTMLPF-P) impacts, AEC evaluates ballistics survivability and lethality, adversarial assessments/threat computer network operations, cooperative vulnerability and penetration assessments (CVPA), and electronic warfare (EW) (attack, protection, and support) in support of the National Defense Authorization Act (NDAA) 2016 Section 1647, establishment of Cybersecurity and Electromagnetic Effects (CEMA). AEC manages, plans, and executes Information Assurance (IA) operational assessments during annual Combatant Command and Army Service exercises in support of the congressionally mandated Office of the Secretary of Defense Director, Operational Test and Evaluation (OSD DOT&E) assessment, and performs the operational test agency (OTA) duties for the Ballistic Missile Defense System.

This PE funds direct civilian labor and minimum non-labor requirements to include: Temporary Duty (TDY), personnel training, career development, supplies and equipment, hardware, software, and other external Other Government Agency (OGA) support as well as methodology development required to evaluate emerging technologies and instrumentation requirements.

AEC consists of seven directorates (Aviation-Fires Evaluation Directorate; BMD Evaluation Directorate (funded by the MDA); C4ISR Evaluation Directorate; Mounted Systems Evaluation Directorate; Readiness and Analytics Evaluation Directorate (RAED); Soldier Evaluation Directorate; and Survivability Evaluation Directorate) and a lean headquarters element as AEC receives staff services from the ATEC HQ. The AEC primary competencies are: Identify what decision makers need to know; plan and direct test and evaluation strategies; evaluate operational effectiveness, suitability, survivability and safety; and provide senior leadership unbiased advice on Army programs.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605716A / Army Evaluation Center	Project (Number/Name) 302 / Army Evaluation Center	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019 FY 2020 FY 2021
Title: AEC Description: AEC provides integrated technical and operational evaluations and continuous evaluation of assigned weapon systems and major automated information systems for major milestone decisions, materiel changes, and materiel releases in support of the Army Acquisition Executive and force development. AEC develops the evaluation strategy, designs technical and operational tests, and evaluates the test results to address the combat effectiveness, suitability, survivability, and safety factors pertinent to the decision process for hundreds of systems/programs across the Army, other Services, and Agencies. AEC prepares integrated System Evaluation Plans and conducts integrated technical and operational evaluations for all assigned systems, assisting the Chief of Staff of the Army decision making process by supporting the AROC processes as well as provide support to the AFC through the CFT concept. In support of Overseas Contingency Operations (OCO) and other real-world events, AEC continues to provide Capability & Limitation Reports and safety verification documents.		56.529	60.439
FY 2020 Plans: Cover operational costs for AEC including civilian pay and non-labor costs (approximately 94% of AEC's total budget is civilian labor). Assist United States Army Training And Doctrine Command in developing operational relevant, total system focused critical operational issues and criteria that can be evaluated. Develop and apply new techniques in data mining, data visualization and presentation of large data sets. Continue research and develop evaluation metrics for new and emerging technologies such as signature management and human cognition.		63.141	
FY 2021 Plans: Will continue to cover operational costs for AEC including civilian pay and non-labor costs (approximately 94% of AEC's total budget is civilian labor). Assist AFC in developing operationally relevant, total system focused COIC that can be evaluated. Develop and apply new techniques in data mining, data visualization and presentation of large data sets. Continue research and develop evaluation metrics for new and emerging technologies such as artificial intelligence, signature management, hypersonics, directed energy, and human cognition.			
FY 2020 to FY 2021 Increase/Decrease Statement: Increase funds civilian personnel to provide support for capabilities development process as well as CFT efforts to support the Army modernization strategy.		0.003	-
Title: FY 2018 NDAA Section 825 Major Defense Acquisition Program (MDAP) Cost Overrun Description: FY 2018 NDAA Section 825 MDAP Cost Overrun		-	-
Title: FY 2020 SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC ?638		0.376	-
FY 2020 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605716A / Army Evaluation Center	Project (Number/Name) 302 / Army Evaluation Center	
B. Accomplishments/Planned Programs (\$ in Millions) Funding transferred in accordance with Title 15 USC ?638 FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638			FY 2019 FY 2020 FY 2021
Accomplishments/Planned Programs Subtotals			56.532 60.815 63.141
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0605718A / Army Modeling & Sim X-Cmd Collaboration & Integ							
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	2.708	2.527	2.572	-	2.572	2.665	2.718	2.772	2.800	0.000	18.762
S03: Analysis M&S Tools and Services	-	2.708	2.527	2.572	-	2.572	2.665	2.718	2.772	2.800	0.000	18.762

A. Mission Description and Budget Item Justification

This Program Element (PE) promotes the Army's Modeling and Simulation (M&S) strategy, defined by five guiding priorities: (1) formulate Army M&S policies; (2) develop and employ management processes for models, simulations and data; (3) develop M&S standards, architectures, networks and environments; (4) develop/employ new M&S tools and simulation technology; (5) develop an M&S workforce. Specifically, this PE focuses on priorities 3 and 4.

M&S Standards, Architectures, Networks and Environments: The consistent use of standards, architectures, networks and environments advances the goal of interoperability. The Army coordinates with Joint, Interagency, Intergovernmental, and Multinational (JIIM) partners along with industry and academia to develop/employ standards that promote collaboration and facilitate the sharing of tools, data and information. The Army oversees procedures and processes for the appropriate use of standards to foster common formats and increase M&S and data reuse. The Army ensures these standards, architectures, networks and environments are readily accessible and can be reliably applied by users.

M&S Tools and Simulation Technology: The Army must have credible M&S tools and data to support the full range of Army organizational missions and functional responsibilities. M&S results that are timely and credible enhance decision making. The Army must develop and accredit reliable M&S tools so that decision makers and senior leaders benefit from the results and thus support the continued development, integration and use of such tools. To ensure credibility and reliability of results, M&S managers, developers and users must make the capabilities, constraints, limitations and assumptions of their M&S tools readily accessible. PE 0605718A provides for the development and employment of tools in the form of models, simulations and data that support the full range of Army interests and deliver timely information to enhance effective decision making. Moreover, these tools can be documented, verified, validated and accredited for their intended purpose in order to provide timely, credible results.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army					Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)				
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support	PE 0605718A / Army Modeling & Sim X-Cmd Collaboration & Integ				
B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	2.798	2.527	2.574	-	2.574
Current President's Budget	2.708	2.527	2.572	-	2.572
Total Adjustments	-0.090	0.000	-0.002	-	-0.002
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.090	-			
• Adjustments to Budget Years	-	-	-0.002	-	-0.002

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)			
2040 / 6					PE 0605718A / Army Modeling & Sim X-Cmd Collaboration & Integ				S03 / Analysis M&S Tools and Services			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
S03: Analysis M&S Tools and Services	-	2.708	2.527	2.572	-	2.572	2.665	2.718	2.772	2.800	0.000	18.762
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	

A. Mission Description and Budget Item Justification

This Project has two functions:

Function 1 (Priority 3 of the "Army Modeling and Simulation (M&S) Strategy") -- Develop M&S standards, architectures, networks and environments that promote sharing, interoperability, access, and reliable application of tools, formats, data and information among/for users.

Function 2 (priority 4 of the "Army M&S Strategy") -- Develop and improve tools and technology in the form of models, simulations and data that support the full range of Army interests and deliver timely information to enhance effective decision making. These tools can be documented, verified, validated and accredited for their intended purpose.

Resources under Project S03 support the M&S communities (Acquisition, Analysis, Experimentation, Test & Evaluation, Training, Intelligence) at the enterprise level through enabling efforts. These efforts include the following: (a) design models, simulations, data and tools that are resident within one organization but reusable and trusted by M&S users and specialists across the Army M&S enterprise; (b) leverage industry and academia; (c) promote interoperability within M&S and between M&S and operational capabilities.

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

Title: Develop M&S standards, architectures, networks and environments	FY 2019	FY 2020	FY 2021
Description: Develop M&S standards, architectures, networks and environments that promote sharing, interoperability, access, and reliable application of tools, formats, data and information among/for users.	0.840	0.784	0.850
FY 2020 Plans: Fiscal Year (FY) 2020 funds will be distributed among activities that promote the third priority of the Army M&S Strategy: develop M&S standards, architectures, networks and environments. Specific FY 2020 plans include: a.) development and access to cyber/electronic warfare simulated environments, b.) development of an enhanced fires training and testing environment, c.) development of an Operational Environment (OE) signal architecture, d.) enhancement and access to a network modeling architecture that bridges multiple modeling and simulation environments. FY2020 M&S standards, architectures, networks and environment plans will be developed to maximize reuse across the five Army M&S-enabled communities.			
FY 2021 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605718A / Army Modeling & Sim X-Cmd Collaboration & Integ	Project (Number/Name) S03 / Analysis M&S Tools and Services			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019	FY 2020	FY 2021
<p>Fiscal Year (FY) 2021 funds will be distributed among activities that promote the Army M&S Strategy: develop M&S standards, architectures, networks and environments. Specific FY 2021 plans include: a.) development and access to cyber/electronic warfare simulated environments, b.) development of an enhanced fires training and testing environment, c.) development of an Operational Environment (OE) signal architecture, d.) enhancement and access to a network modeling architecture that bridges multiple modeling and simulation environments. FY 2021 M&S standards, architectures, networks and environment plans will be developed to maximize reuse across the Army M&S-enabled communities.</p>					
<p>FY 2020 to FY 2021 Increase/Decrease Statement: Slight increase in requirements</p>					
<p>Title: Develop M&S tools and technology</p> <p>Description: Develop and improve tools and technology in the form of models, simulations and data that support the full range of Army interests and deliver timely information to enhance effective decision making. These tools can be documented, verified and validated for their intended purpose.</p>					
<p>FY 2020 Plans: Fiscal Year (FY) 2020 funds will be distributed among activities that promote the fourth priority of the Army M&S Strategy: develop M&S tools and technology. Specific FY 2019 plans include: a.) development of an Army Fires Community Army Effectiveness Model (AEM); b.) development of network modeling scenarios and models for the test/evaluation and analysis network communities; c.) update and enhance intelligence models for existing simulations and Mission Command Information Systems (MCIS). FY 2019 M&S tools and technology plans will be developed to maximize reuse across the five Army M&S-enabled communities.</p>					
<p>FY 2021 Plans: Fiscal Year (FY) 2021 funds will be distributed among activities that promote the priorities of the Army M&S Strategy: develop M&S tools and technology. Specific FY 2021 plans include: a.) development of an Army Fires Community Army Effectiveness Model (AEM); b.) development of network modeling scenarios and models for the test/evaluation and analysis network communities; c.) update and enhance intelligence models for existing simulations and Mission Command Information Systems (MCIS). FY 2021 M&S tools and technology plans will be developed to maximize reuse across the five Army M&S-enabled communities.</p>					
<p>FY 2020 to FY 2021 Increase/Decrease Statement: Slight increase in requirements.</p>					
<p>Title: FY 2020 SBIR/STTR Transfer</p> <p>Description: Funding transferred in accordance with Title 15 USC ?638</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605718A / Army Modeling & Sim X-Cmd Collaboration & Integ	Project (Number/Name) S03 / Analysis M&S Tools and Services
B. Accomplishments/Planned Programs (\$ in Millions) FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638 FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638		FY 2019
	Accomplishments/Planned Programs Subtotals	2.708
		2.527
		2.572
C. Other Program Funding Summary (\$ in Millions) <u>N/A</u>		
Remarks		
D. Acquisition Strategy <u>N/A</u>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0605801A / Programwide Activities							
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	60.218	58.175	87.472	-	87.472	91.558	95.428	98.173	98.167	0.000	589.191
EU9: Army Science Board	-	3.056	2.250	2.248	-	2.248	2.248	2.248	2.248	2.271	0.000	16.569
M02: Med Cmd Spt (Non-AMHA)	-	26.223	24.052	20.431	-	20.431	23.142	23.550	24.013	24.003	0.000	165.414
M15: ARI Mgmt/ADM Act	-	1.465	1.550	1.584	-	1.584	1.628	1.659	1.677	1.677	0.000	11.240
M16: Standardization Groups	-	3.728	4.297	4.340	-	4.340	4.417	4.458	4.505	4.551	0.000	30.296
M23: US Army Corps of Engineers Base Operations	-	0.000	0.000	33.498	-	33.498	34.129	35.142	35.836	35.669	0.000	174.274
M42: ARDEC Cmd/Ctr Support	-	7.318	7.419	7.270	-	7.270	7.470	7.459	7.856	7.856	0.000	52.648
M44: CECOM Cmd/Ctr Spt	-	4.522	3.819	3.902	-	3.902	3.982	4.801	5.011	5.011	0.000	31.048
M46: AMCOM Cmd/Ctr Spt	-	0.228	3.596	3.432	-	3.432	3.533	3.916	4.093	4.093	0.000	22.891
M47: TACOM Cmd/Ctr Spt	-	3.294	3.629	3.704	-	3.704	3.805	3.853	4.084	4.084	0.000	26.453
M55: Edgewood Chemical Biological Center	-	5.893	3.027	2.611	-	2.611	2.661	3.748	4.166	4.247	0.000	26.353
M58: SECOM CMD/CTR Spt	-	2.429	2.350	2.232	-	2.232	2.278	2.316	2.365	2.365	0.000	16.335
M76: Armament Group Support	-	2.062	2.186	2.220	-	2.220	2.265	2.278	2.319	2.340	0.000	15.670

A. Mission Description and Budget Item Justification

This Program Element (PE) supports the non-Army Management Headquarters Activity (non-AMHA) Research, Development, Test, and Evaluation (RDTE) functions incident to the local operation and management of United States (U.S.) Army Combat Capabilities Development Command (CCDC) Centers, not identifiable with specific research and development projects. This PE also supports the management and operation of multiple, globally-located CCDC International Technology Centers (ITCs). The ITCs play an integral role in the U.S. Army efforts for international cooperative research, development and interoperability, and fulfill international memoranda of understanding requirements.

Programwide activities also include: Army Science Board studies; non-AMHA Medical Command support at the U.S. Army Medical Research and Materiel Command (USAMRMC); non-AMHA management and administrative functions at the U.S. Army Research Institute (ARI); and travel and administrative support to the North Atlantic Treaty Organization (NATO) Army Armaments Group (NAAG).

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army					Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)				
2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	PE 0605801A / <i>Programwide Activities</i>				
B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	60.921	58.175	57.559	-	57.559
Current President's Budget	60.218	58.175	87.472	-	87.472
Total Adjustments	-0.703	0.000	29.913	-	29.913
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.703	-			
• Adjustments to Budget Years	-	-	29.913	-	29.913
<u>Change Summary Explanation</u>					
Fiscal Year 2021 (FY21) increase a result of a New Start Project (Project M23).					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army										Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605801A / Programwide Activities				Project (Number/Name) EU9 / Army Science Board			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
EU9: Army Science Board	-	3.056	2.250	2.248	-	2.248	2.248	2.248	2.248	2.271	0.000	16.569
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	

A. Mission Description and Budget Item Justification

The Army Science Board (ASB) is a federal advisory committee, organized under the Federal Advisory Committee Act (FACA) and the Government in the Sunshine Act, which provides the Secretary of the Army and Secretary of Defense with independent and transparent advice and recommendations on matters relating to scientific, technical, manufacturing, acquisition, logistics, and business management functions. The ASB dates to November 1951 when the Secretary of the Army, Honorable Frank Pace Jr., appointed twelve outstanding scientists and industrialists to a scientific advisory panel to assist him and the Army's leadership in creating an effective, economical, and progressive fighting force using existing technology and industrial resources. Three years later, this panel was expanded and officially designated the Army Scientific Advisory Panel (ASAP), with its first formal meeting held on November 16, 1954. In 1977, with the passage of FACA, the ASB was created to replace the ASAP.

The ASB provides the Army with a resource of world-class scientists, engineers, technologists and operational experts as well as business, policy and managerial specialists from the private sector, academia, non-DoD government agencies and former senior military officers. Its members volunteer their expertise and time to address those critical national security challenges for which the Army's leadership seeks independent and unbiased technical advice. The ASB focuses on issues of importance to large segments of the Army, and its products are delivered in a candid and timely manner.

The Board is composed of 20 voting and 20 non-voting members, each serving three-year terms, and consultants who serve one-year terms. Membership is carefully monitored to ensure that diverse disciplines and points of view are represented. The Secretary of the Army appoints the Chair and Vice Chair from the ASB membership. The ASB Chair also serves as a non-voting observer to the Defense Science Board. ASB membership is augmented by a small number of consultants who are appointed to provide specialized expertise for ASB studies.

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

Title: Army Science Board

Description: The ASB Charter sets the estimated number of Board meetings at four per year. Board members serve without compensation, with the exception of reimbursement for official Board-related travel and per diem. Funds are therefore required to facilitate Board activities and related subcommittee activities. The ASB Charter states that annual requirements will typically entail a personnel cost of seven Full-Time Equivalents.

Currently, the Secretary of the Army has approved four permanent subcommittees to the Board:

- 1) The Army Science Board Basic Science and Disruptive Technologies Subcommittee is composed of not more than 15 members and addresses issues relating to the Army's basic research and disruptive technologies, including Soldier performance

	FY 2019	FY 2020	FY 2021
	3.056	2.148	2.248

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605801A / Programwide Activities	Project (Number/Name) EU9 / Army Science Board	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019 FY 2020 FY 2021
enhancement, cognition improvement, and training; autonomous systems and human-machine teaming; Chemical, Biological, Radiological, Nuclear and high-yield Explosives (CBRNE); and counter Weapons of Mass Destruction.			
2) The Army Science Board Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) Subcommittee is composed of not more than 15 members and addresses issues relating to the Army's C4ISR core competency, including the tactical edge Command, Control, and Communications (C3), situational awareness overmatch, and electronic warfare.			
3) The Army Science Board Systems Engineering, Integration, and Sustainment Subcommittee is composed of not more than 15 members and addresses relating to the Army's core competency in systems engineering and integration; advanced prototyping and experimentation in operational environments; and sustainment, including engineered resilient systems, agile logistics and health management. These competencies are essential to the performance of the entire acquisition community.			
4) the Army Science Board Weapon Systems Subcommittee is composed of not more than 15 members and addresses issues relating to the Army's weapon systems core competency in: Rotorcraft Design Synthesis & Performance Assessment (DS&PA) and airworthiness/safety; ground combat vehicle DS&PA, Soldier interaction, and system integration; lethality, including impact physics, energetics, warhead DS&PA, effects modeling and simulation; survivability and protection, including armor and balanced approach for detection/hit/kill avoidance; and air and missile defense DS&PA, precision fires, seekers, and precision guidance.			
FY 2020 Plans: Conduct four to six studies on behalf of the Secretary of the Army; likely in areas of Basic Science and Disruptive Technology; Weapons Systems; C4ISR; and Systems Engineering, Integrations, and Sustainment or other concerns related to the future of the force.			
FY 2021 Plans: Conduct four to six studies on behalf of the Secretary of the Army; likely in areas of Basic Science and Disruptive Technology; Weapons Systems; C4ISR; and Systems Engineering, Integrations, and Sustainment or other concerns related to the future of the force.			
FY 2020 to FY 2021 Increase/Decrease Statement: Decreases in the funding levels from FY20 to FY21 represent a reduction in studies that focus solely on Army Modernization priorities			
Title: FY 2020 SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC ?638			- 0.102 -

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605801A / Programwide Activities	Project (Number/Name) EU9 / Army Science Board	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020
<i>FY 2020 Plans:</i> Funding transferred in accordance with Title 15 USC ?638			
<i>FY 2020 to FY 2021 Increase/Decrease Statement:</i> Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals		3.056	2.250
			2.248
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army										Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605801A / Programwide Activities				Project (Number/Name) M02 / Med Cmd Spt (Non-AMHA)			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
M02: Med Cmd Spt (Non-AMHA)	-	26.223	24.052	20.431	-	20.431	23.142	23.550	24.013	24.003	0.000	165.414
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	

A. Mission Description and Budget Item Justification

This Project provides funding for authorized civilian workforce performing medical research, development, acquisition management and oversight that support the medical Research, Development, Test, and Evaluation (RDTE) programs at the United States (U.S.) Army Medical Research and Materiel Command (USAMRMC), Fort Detrick, Maryland to: (1) perform planning, programming, and budgeting; (2) manage resources; and (3) ensure compliance with U.S. Food and Drug Administration (FDA) and other regulatory and safety requirements. It also provides for continued operations of contracting and acquisition management functions performed by the U.S. Army Medical Research Acquisition Activity (USAMRAA) in support of the USAMRMC Medical RDTE Program.

Additionally, this Project provides funding for the special immunization program (SIP). The SIP program provides Food and Drug Administration (FDA) licensed vaccines and investigational new drug (IND) vaccines under informed consent to laboratory workers at the U.S. Army Medical Research Institute of Infectious Diseases, and to other military, government, or contractor personnel who may be at risk of exposure to highly hazardous pathogenic microorganisms or toxins.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Title: Civilian Authorized Salaries and other operational requirements	26.223	23.919	20.431
Description: Funding is provided to the USAMRMC for Medical Research Development Acquisition (RDA) Management and Oversight to include the payroll of civilians as well as nominal operating expense. Expertise helps establish and maintain the capabilities that Army medicine needs to sustain life, limb, and eyesight for our warfighters. Civilian labor performs centralized management of Medical RDA (many areas required by law and/or regulation) including animal & human research protections, health and safety compliance, environmental management, and U.S. Food and Drug Administration regulatory compliance, legal support (including intellectual property protection), quality assurance, contracting services, personnel management, and planning, programming, and budgeting, and execution management. Funding also supports the Army's portion of the Special Immunization Program that protects individuals engaged in infectious disease research if exposed to pathogens or toxins.			
FY 2020 Plans: Will fund authorized civilian salaries and associated expenses (supplies, equipment, travel, etc) at USAMRMC and USAMRAA. Also, will provide regulatory, clinical monitoring and data support for the Special Immunization Program. This program will provide non licensed vaccines under FDA oversight to personnel at risk of exposure to selected infectious diseases.			
FY 2021 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 6	PE 0605801A / Programwide Activities	M02 / Med Cmd Spt (Non-AMHA)	
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Will fund authorized civilian salaries and associated expenses (supplies, equipment, travel, etc.) at USAMRDC and USAMRAA. Also will provide regulatory, clinical monitoring and data support for the SIP. This program will provide non-licensed vaccines under FDA oversight to personnel at risk of exposure to selected infectious diseases.			
<i>FY 2020 to FY 2021 Increase/Decrease Statement:</i>			
Decrease in civilian salaries and associated expenses based on Army realignment of medical RDTE funding to support modernization priorities.			
Title: FY 2020 SBIR/STTR Transfer	-	0.133	-
Description: Funding transferred in accordance with Title 15 USC ?638			
<i>FY 2020 Plans:</i>			
Funding transferred in accordance with Title 15 USC ?638			
<i>FY 2020 to FY 2021 Increase/Decrease Statement:</i>			
Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals			
	26.223	24.052	20.431
C. Other Program Funding Summary (\$ in Millions)			
N/A			
<u>Remarks</u>			
D. Acquisition Strategy			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605801A / Programwide Activities				Project (Number/Name) M15 / ARI Mgmt/ADM Act				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
M15: ARI Mgmt/ADM Act	-	1.465	1.550	1.584	-	1.584	1.628	1.659	1.677	1.677	0.000	11.240	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-	

A. Mission Description and Budget Item Justification

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) is the only Science and Technology (S&T) laboratory that conducts research to enhance the Soldier lifecycle (e.g., selection, assignment, training, leader development) and human relations (e.g., culture of dignity, respect, and inclusion). This Project supports the non-Army Management Headquarters Activity (non-AMHA) management and administrative functions to enable ARI to accomplish its research mission and includes activities such as budget execution, procurement oversight, RDT&E program planning and evaluation, management control, security/safety, logistics, information technology, and personnel/manpower execution and oversight. ARI's behavioral and social science research provides effective non-materiel solutions to help the Army adjust to changes in force size and structure, a variety of mission demands and contexts, challenges in human relations, and budgetary constraints.

The cited work is consistent with the Assistant Secretary of Defense (Research and Engineering) priority focus areas, the Army Vision, the Army's Talent Management Strategy, and the Army Modernization Strategy.

Work is performed by the United States (U.S.) Army Research Institute (ARI) for the Behavioral and Social Sciences in Fort Belvoir, VA.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Title: ARI Management/Administrative Actions	1.465	1.479	1.584
Description: Supports the non-Army Management Headquarters Activity (non-AMHA) management and administrative functions. This project provides enduring management and support functions for the execution of ARI's science and technology activities.			
FY 2020 Plans: Providing operation of management, administrative, personnel, budget, and support functions at a level consistent with Army and mission requirements to meet the needs of ARI as an Army Laboratory conducting the Army's personnel, training, leader development, and organizational performance R&D program.			
FY 2021 Plans: Will provide operation of management, administrative, personnel, budget, and support functions at a level consistent with Army and mission requirements to meet the needs of ARI as an Army Science and Technology (STR), to include emphasis on the hardware and software requirement to build and sustain data analytic capabilities throughout the laboratory.			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding change reflects planned lifecycle of this effort.			
Title: FY 2020 SBIR/STTR Transfer	-	0.071	-

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605801A / Programwide Activities	Project (Number/Name) M15 / ARI Mgmt/ADM Act		
B. Accomplishments/Planned Programs (\$ in Millions) <i>Description:</i> Funding transferred in accordance with Title 15 USC ?638 <i>FY 2020 Plans:</i> Funding transferred in accordance with Title 15 USC ?638 <i>FY 2020 to FY 2021 Increase/Decrease Statement:</i> Funding transferred in accordance with Title 15 USC ?638	FY 2019	FY 2020		
		FY 2021		
	Accomplishments/Planned Programs Subtotals	1.465	1.550	1.584
C. Other Program Funding Summary (\$ in Millions) N/A				
Remarks				
D. Acquisition Strategy N/A				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605801A / Programwide Activities				Project (Number/Name) M16 / Standardization Groups				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
M16: Standardization Groups	-	3.728	4.297	4.340	-	4.340	4.417	4.458	4.505	4.551	0.000	30.296	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-	

A. Mission Description and Budget Item Justification

This Project supports nine International Technology Centers (formerly known as Standardization Groups) in North America, South America, Asia, and Europe for personnel, travel and overhead costs, leases on buildings, and mandatory permanent change of station.

The mission of the International Technology Centers is to support the United States (U.S.) Army Rationalization, Standardization and Interoperability (RSI) mission around the globe as specified in Army Regulation (AR) 34-1 "Multinational Force Interoperability" and AR 70-41 "International Cooperative Research, Development and Acquisition (ICRDA)". ITCs represent the U.S. Army in their geographic areas of responsibility (AOR) with foreign ministries of defense on ICRDA programs. ITCs also facilitate U.S. Army interaction in their geographic AOR with foreign non-governmental entities, such as foreign private industry and academia.

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

FY 2019	FY 2020	FY 2021
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Title: International Technology Centers Management

3.728	4.205	4.340
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Description: This activity funds the U.S. Army Rationalization, Standardization, and Interoperability mission conducted by the nine International Technology Centers around the globe. These funds support the infrastructure, personnel and travel requirements to support the mission.

FY 2020 Plans:

Will represent the U.S. Army's interests in engagements with foreign ministries of defense on International Cooperative Research, Development and Acquisition (RDA) programs. Will facilitate U.S. Army interaction with foreign non-government entities, such as foreign private industry and academia.

FY 2021 Plans:

Will represent the U.S. Army's interests in engagements with foreign ministries of defense on International Cooperative RDA programs. Will facilitate U.S. Army interaction with foreign non-government entities, such as foreign private industry and academia.

FY 2020 to FY 2021 Increase/Decrease Statement:

FY21 decrease due to economic adjustment.

Title: FY 2020 SBIR/STTR Transfer

-	0.092	-
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Description: Funding transferred in accordance with Title 15 USC ?638

FY 2020 Plans:

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>	Project (Number/Name) M16 / <i>Standardization Groups</i>	
B. Accomplishments/Planned Programs (\$ in Millions) Funding transferred in accordance with Title 15 USC ?638		FY 2019	FY 2020
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638			FY 2021
	Accomplishments/Planned Programs Subtotals	3.728	4.297
			4.340
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605801A / Programwide Activities					Project (Number/Name) M23 / US Army Corps of Engineers Base Operations			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
M23: US Army Corps of Engineers Base Operations	-	0.000	0.000	33.498	-	33.498	34.129	35.142	35.836	35.669	0.000	174.274	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

Note

This is a new start in FY2021.

This Project is a New Start in Fiscal Year 2021 (FY21).

A. Mission Description and Budget Item Justification

This Project provides funding for authorized civilian workforce performing engineer research, development, management and oversight that support the engineer Research, Development, Test, and Evaluation (RDTE) programs at the United States (U.S.) Engineer Research and Development Center (ERDC). This Project supports the non-Army Management Headquarters Activity (non-AMHA) management and administrative functions to enable ERDC to accomplish its research mission and includes activities such as procurement oversight, RDTE programming and budget execution, management control and oversight, security/safety, information management and technology, personnel/manpower execution and oversight, research laboratory/facility management and maintenance, and High Performance Computing Modernization Program (HPCMP) facility operations and management

ERDC research in civil and military engineering, blast and weapons effects, battlespace terrain mapping and characterization, computational prototyping of military platforms, and cold regions science and engineering provides effective non-materiel and materiel solutions to enable the Army to achieve its modernization priorities of Air and Missile Defense, Next Generation Combat Vehicle, Future Vertical Lift, Network, Long Range Precision Fires, and Soldier Lethality.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Title: ERDC Management and Administrative Actions and Other Operational Requirements	-	-	33.498
Description: Supports the non-AMHA management and administrative functions as follows.			
FY 2021 Plans: Will provide operation of management, administrative, personnel, budget, and support functions at a level consistent with Army and mission requirements to meet the needs of ERDC conducting the Army's engineer research and development (R&D) program supporting all six of the Army's Modernization Priorities..			
FY 2020 to FY 2021 Increase/Decrease Statement: Funds realigned from the Operations & Maintenance, Army (OMA) appropriation.			
Accomplishments/Planned Programs Subtotals	-	-	33.498

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>	Project (Number/Name) M23 / <i>US Army Corps of Engineers Base Operations</i>
C. Other Program Funding Summary (\$ in Millions)		
N/A		
Remarks		
D. Acquisition Strategy		
N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605801A / Programwide Activities				Project (Number/Name) M42 / ARDEC Cmd/Ctr Support				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
M42: ARDEC Cmd/Ctr Support	-	7.318	7.419	7.270	-	7.270	7.470	7.459	7.856	7.856	0.000	52.648	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project supports the non-Army Management Headquarters Activity (non-AMHA) functions incident to the local operation and management of the United States (U.S.) Army Combat Capabilities Development Command (CCDC) Armaments Center (AC), Picatinny Arsenal, NJ, not identifiable with specific research and development Projects financed under other Program Elements.

Funds only select, critical, overarching functions that enable the CCDC AC to accomplish its research, development and engineering mission, to include CCDC AC headquarters staff, safety, physical security, anti-terrorism, operations security (OPSEC), information security and intelligence services.

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

Title: Management Support

FY 2019	FY 2020	FY 2021
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7.318	7.419	7.270
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Description: CCDC Armaments Center (AC) management / administrative efforts.

FY 2020 Plans:

Will provide management and administrative functions at a level consistent with mission requirements and support needs at the Armaments Research, Development, and Engineering Center (ARDEC).

FY 2021 Plans:

Will provide management and administrative functions at a level consistent with mission requirements and support needs at CCDC AC.

FY 2020 to FY 2021 Increase/Decrease Statement:

FY21 decrease due to economic adjustment.

Accomplishments/Planned Programs Subtotals

7.318	7.419	7.270
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C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605801A / Programwide Activities				Project (Number/Name) M44 / CECOM Cmd/Ctr Spt				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
M44: CECOM Cmd/Ctr Spt	-	4.522	3.819	3.902	-	3.902	3.982	4.801	5.011	5.011	0.000	31.048	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification													
Supports the non-Army Management Headquarters Activity (non-AMHA) functions incident to the local operation and management of the United States (U.S.) Army Combat Capabilities Development Command (CCDC) Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance, and Reconnaissance (C5ISR) Center, located at Aberdeen Proving Ground, MD. These efforts are not identifiable with specific research and development projects financed under other program elements.													
Funds only select, critical, overarching functions that enable CCDC C5ISR to accomplish its research, development and engineering mission, to include CCDC C5ISR headquarters staff, resource management, human resources, safety, security, protocol, public affairs, information management, facility management and audit readiness.													
B. Accomplishments/Planned Programs (\$ in Millions)											FY 2019	FY 2020	FY 2021
Title: Management Support											4.522	3.819	3.902
Description: CCDC Command, Control, Communications, Computers, Cyber Intelligence, Surveillance and Reconnaissance (C5ISR) Center management and administrative efforts.													
FY 2020 Plans: Will provide management and administrative functions at a level consistent with mission requirements and support needs at the Communications-Electronics Research, Development, and Engineering Center (CERDEC).													
FY 2021 Plans: Will provide management and administrative functions at a level consistent with mission requirements and support needs at CCDC C5ISR.													
FY 2020 to FY 2021 Increase/Decrease Statement: FY21 increase due to economic adjustment.													
Accomplishments/Planned Programs Subtotals											4.522	3.819	3.902
C. Other Program Funding Summary (\$ in Millions)													
N/A													
Remarks													

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>	Project (Number/Name) M44 / CECOM Cmd/Ctr Spt
D. Acquisition Strategy N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605801A / Programwide Activities				Project (Number/Name) M46 / AMCOM Cmd/Ctr Spt				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
M46: AMCOM Cmd/Ctr Spt	-	0.228	3.596	3.432	-	3.432	3.533	3.916	4.093	4.093	0.000	22.891	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification													
This Project supports the non-Army Management Headquarters Activity (non-AMHA) functions incident to the local operation and management of the United States (U.S.) Army Combat Capabilities Development Command (CCDC) Aviation and Missile Center (AvMC), Redstone Arsenal, AL. Such functions are not identifiable with specific research and development Projects financed under other Program Elements.													
Minimally funds select, critical, overarching functions in support of CCDC AvMC accomplishing its research, development and engineering mission.													
B. Accomplishments/Planned Programs (\$ in Millions)													
Title: Management Support													
Description: CCDC Aviation and Missile Center (AvMC) management and administrative efforts.													
FY 2020 Plans: Will provide management and administrative functions at a level consistent with mission requirements and support needs at AvMC.													
FY 2021 Plans: Will provide management and administrative functions at a level consistent with mission requirements and support needs at CCDC AvMC.													
FY 2020 to FY 2021 Increase/Decrease Statement: FY21 decrease due to economic adjustment.													
Accomplishments/Planned Programs Subtotals													
0.228 3.596 3.432													
C. Other Program Funding Summary (\$ in Millions)													
N/A													
Remarks													
D. Acquisition Strategy													
N/A													

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605801A / Programwide Activities				Project (Number/Name) M47 / TACOM Cmd/Ctr Spt				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
M47: TACOM Cmd/Ctr Spt	-	3.294	3.629	3.704	-	3.704	3.805	3.853	4.084	4.084	0.000	26.453	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification													
This Project supports the non-Army Management Headquarters Activity (non-AMHA) functions incident to the local operation and management of the United States Army Combat Capabilities Development Command (CCDC) Ground Vehicle Systems Center (GVSC), Warren, MI, not identifiable with specific research and development Projects financed under other Program Elements.													
Funds only select, critical, overarching management functions that enable CCDC GVSC to accomplish its research, development and engineering mission.													
B. Accomplishments/Planned Programs (\$ in Millions)													
Title: Management Support													
Description: CCDC Ground Vehicle Systems Center (GVSC) management and administrative efforts.													
FY 2020 Plans: Will provide management and administrative functions at a level consistent with mission requirements and support needs at CCDC GVSC.													
FY 2021 Plans: Will provide management and administrative functions at a level consistent with mission requirements and support needs at CCDC GVSC.													
FY 2020 to FY 2021 Increase/Decrease Statement: FY21 increase due to economic adjustment.													
Accomplishments/Planned Programs Subtotals													
3.294 3.629 3.704													
C. Other Program Funding Summary (\$ in Millions)													
N/A													
Remarks													
D. Acquisition Strategy													
N/A													

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605801A / Programwide Activities					Project (Number/Name) M55 / Edgewood Chemical Biological Center			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
M55: <i>Edgewood Chemical Biological Center</i>	-	5.893	3.027	2.611	-	2.611	2.661	3.748	4.166	4.247	0.000	26.353	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification													
This Project supports the non-Army Management Headquarters Activity (non-AMHA) functions incident to the local operation and management of the United States Army Combat Capabilities Development Command (CCDC) Chemical Biological Center (CBC), Aberdeen Proving Ground, MD, not identifiable with specific research and development Projects financed under other Program Elements.													
Funds only select, critical, overarching functions that enable CCDC CBC to accomplish its mission to include CCDC CBC headquarter staff, resource management, safety, and surety programs. In addition, this program includes the management and oversight of Army chemical surety operations as directed by Department of Defense (DoD) Instruction 5210.65, "Minimum Security Standards for Safeguarding Chemical Agents".													
B. Accomplishments/Planned Programs (\$ in Millions)													
Title: Management Support													
Description: CCDC Chemical Biological Center (CBC) management and administrative efforts.													
FY 2020 Plans: Will provide continued management and administrative functions at a level consistent with mission requirements and support needs at CCDC CBC.													
FY 2021 Plans: Will provide continued management and administrative functions at a level consistent with mission requirements and support needs at CCDC CBC.													
FY 2020 to FY 2021 Increase/Decrease Statement: FY21 decrease due to economic adjustment.													
Title: FY 2020 SBIR/STTR Transfer													
Description: Funding transferred in accordance with Title 15 USC ?638													
FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638													
FY 2020 to FY 2021 Increase/Decrease Statement:													

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>	Project (Number/Name) M55 / <i>Edgewood Chemical Biological Center</i>
B. Accomplishments/Planned Programs (\$ in Millions) Funding transferred in accordance with Title 15 USC ?638		FY 2019 FY 2020 FY 2021
	Accomplishments/Planned Programs Subtotals	5.893 3.027 2.611
C. Other Program Funding Summary (\$ in Millions) <u>N/A</u>		
Remarks		
D. Acquisition Strategy <u>N/A</u>		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army										Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605801A / Programwide Activities				Project (Number/Name) M58 / SECOM CMD/CTR Spt			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
M58: SECOM CMD/CTR Spt	-	2.429	2.350	2.232	-	2.232	2.278	2.316	2.365	2.365	0.000	16.335
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	

A. Mission Description and Budget Item Justification

This Project supports the non-Army Management Headquarters Activity (non-AMHA) functions incident to the local operation and management of the United States Army Combat Capabilities Development Command (CCDC) Soldier Center (SC), Natick, MA, not identifiable with specific research and development Projects financed under other Program Elements.

Funds only select, critical, overarching functions that enable CCDC SC to accomplish its research, development and engineering mission, to include: Manpower/Personnel, Intelligence/Security, Operations, Logistics, Training, Resource Management and Headquarter administrative staff.

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

	FY 2019	FY 2020	FY 2021
Title: Management Support	2.429	2.243	2.232
Description: CCDC Soldier Center (SC) management and administrative functions.			
FY 2020 Plans: Will provide continued management and administrative functions at a level consistent with mission requirements and support needs at CCDC SC.			
FY 2021 Plans: Will provide continued management and administrative functions at a level consistent with mission requirements and support needs at CCDC SC.			
FY 2020 to FY 2021 Increase/Decrease Statement: FY21 decrease due to economic adjustment.			
Title: FY 2020 SBIR/STTR Transfer	-	0.107	-
Description: Funding transferred in accordance with Title 15 USC ?638			
FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals	2.429	2.350	2.232

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army	Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605801A / <i>Programwide Activities</i>	Project (Number/Name) M58 / <i>SECOM CMD/CTR Spt</i>
C. Other Program Funding Summary (\$ in Millions)		
N/A		
Remarks		
D. Acquisition Strategy		
N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605801A / Programwide Activities				Project (Number/Name) M76 / Armament Group Support				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
M76: Armament Group Support	-	2.062	2.186	2.220	-	2.220	2.265	2.278	2.319	2.340	0.000	15.670	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The goal of this Project is to expand worldwide allied standardization and interoperability through cooperative research and development (R&D) and technology sharing per Secretary of Defense guidance and especially in support of the United States (U.S.) Army. This Project partially funds the travel costs and administrative support (studies, analysis, interpretation, equipment, etc.) required to participate in international forums, such as the North Atlantic Treaty Organization (NATO) Army Armaments Group (NAAG), Defense Against Terrorism (DAT) and to pursue new cooperative R&D initiatives and international cooperative agreements such as memoranda of understanding. This Project also includes the United States' share of costs of the NATO Civil Budget, Chapter IX, which funds the NATO Industrial Advisory Group (NIAG) and the Special Fund for Cooperative Planning (U.S. Army is Executive Agent for this NATO bill). This Project also partially funds the Five Power Senior National Representatives, Army (SNR (A)), the Technical Cooperative Program, Bilateral SNR(A)s, and Army armaments working groups with many nations.

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

Title: Army Scientific Support NATO Army Armaments Group	FY 2019	FY 2020	FY 2021
Description: Funds supported Army subject matter experts to attend scientific and technological exchange, meetings, demonstrations, and/or simulations having military application and mutual benefits to the U.S. and its Allies.	0.307	0.263	0.318
FY 2020 Plans: Funds support Army Subject Matter Experts (SMEs) to attend scientific and technological exchange, meetings demonstrations, and/or simulations having military application and mutual benefits to the United States and its Allies and will fund 8 different working/capability groups that will meet twice a year.			
FY 2021 Plans: Funds support Army SMEs to attend scientific and technological exchange, meetings demonstrations, and/or simulations having military application and mutual benefits to the United States and its Allies and will fund 8 different working/capability groups that will meet twice a year.			
FY 2020 to FY 2021 Increase/Decrease Statement: The increase is to cover the 2% inflation and additional support to NATO Army Armaments Group meetings for 8 Working Groups.			
Title: Executive Agent	1.755	1.824	1.902
Description: Funds the U.S. share of the Mandatory NATO Civil Budget, Chapter IX (Defense Support Programs). U.S. Army is Executive Agent for this Mandatory NATO bill.			
FY 2020 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605801A / Programwide Activities	Project (Number/Name) M76 / Armament Group Support			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019	FY 2020	FY 2021
Funds support the United States share of the NATO Civil Budget, Chapter IX (Defense Support Program). U.S. Army is the Executive Agent for this mandatory NATO Bill.					
FY 2021 Plans: Funds support the United States share of the NATO Civil Budget, Chapter IX (Defense Support Program). U.S. Army is the Executive Agent for this mandatory NATO Bill.					
FY 2020 to FY 2021 Increase/Decrease Statement: The increase is to cover the 2% inflation and additional support to NATO Army Armaments Group meetings for 8 Working Groups.					
Title: FY 2020 SBIR/STTR Transfer			-	0.099	-
Description: Funding transferred in accordance with Title 15 USC ?638					
FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638					
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638					
Accomplishments/Planned Programs Subtotals			2.062	2.186	2.220
C. Other Program Funding Summary (\$ in Millions)					
N/A					
Remarks					
D. Acquisition Strategy					
N/A					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army										Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0605803A / Technical Information Activities							
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	28.237	30.060	26.244	-	26.244	22.032	22.575	23.118	23.449	0.000	175.715
720: Tech Info Func Actv	-	4.616	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.616
727: Tech Info Activities	-	7.787	10.556	11.087	-	11.087	11.672	12.095	12.395	12.523	0.000	78.115
730: Pers & Trng Analys Act	-	1.317	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.317
731: Army High Performance Computing Centers	-	4.543	1.995	2.037	-	2.037	2.100	2.137	2.133	2.154	0.000	17.099
733: Acquisition Tech Act	-	3.412	9.278	4.800	-	4.800	4.867	4.942	5.009	5.122	0.000	37.430
C16: FAST	-	1.602	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.602
C18: BAST	-	1.865	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.865
CC2: Expeditionary Technologies	-	0.000	0.000	5.000	-	5.000	0.000	0.000	0.000	0.000	0.000	5.000
DW3: Army Geospatial Enterprise Implementation	-	3.095	8.231	3.320	-	3.320	3.393	3.401	3.581	3.650	0.000	28.671

A. Mission Description and Budget Item Justification

This Program Element (PE) supports upgrading the accuracy, timeliness, availability, and accessibility of scientific, technical, and management information at all levels of the Army Research and Development (R&D) community. Management of this information is critical to achieve the goals established by the Army's Senior Leadership. Use of accurate and timely technical information is essential to successfully meeting the milestones required on the path to the future force, allowing Army Science and Technology (S&T) leadership to refine investment strategy and quickly react to emerging opportunities and issues. This PE includes initiatives to improve information derivation, storage, access, display, validation, transmission, distribution, and interpretation, along with initiatives to develop and enhance a single business model for Army S&T knowledge management information technology and to provide for Independent Review Team analysis of technology maturity as part of the Technology Area Readiness Assessment. Conducts Army S&T strategic planning, prioritization, analysis and assessment (Projects 720 and 727). This PE also addresses the need to increase the competitiveness and availability of scientific, engineering, and technical skills in the DoD and National workforce through outreach programs aimed at middle school through college students and teachers. Project 730 provides funding for assessments in attitudes and opinions, longitudinal trends in Soldier and leader perceptions, and emerging issues that provide senior Army leaders with information on Soldiers' perceptions to inform personnel policy and program decision-making concerning manpower, personnel, and training issues. Project 731 provides funding for support for Army high performance computing centers. Project 733 provides funding for improvements to the Army's acquisition process, while Project C16 supports combatant commanders and major Army commands by providing science advisors to address scientific and technical issues and by providing engineering teams to solve field Army technical problems. Project DW3 supports Army Geospatial Enterprise (AGE) Implementation with systems engineering, architecture, and test and certification of Army Acquisition Systems. Finally, this PE funds studies by the Board on Army Science and Technology (BAST) (Project C18). Coordination of this PE with the other Services is achieved through inter-service working groups.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army		Date: February 2020			
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>				
The cited work is consistent with the Under Secretary of Defense for Research and Engineering Science and Technology priority focus areas and the Army Modernization Strategy.					
Work in this PE is performed by the Research, Development, and Engineering Command (RDECOM), Aberdeen Proving Ground, MD; the Army Research Institute for the Behavioral and Social Sciences (ARI), Ft. Belvoir, VA; the Army Corps of Engineers' Engineer Research and Development Center (ERDC), Vicksburg, MS; Medical Research and Materiel Command (MRMC), Ft. Detrick, MD; Space and Missile Defense Command (SMDC), Huntsville, AL; the Army Geospatial Center (AGC) in Alexandria, VA; Tank Automotive Research, Development, and Engineering Center (TARDEC), Warren, MI; the Information Management Office, Arlington, VA; and the Office of the Assistant Secretary of the Army, Acquisition, Logistics and Technology.					
B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	29.024	25.060	25.698	-	25.698
Current President's Budget	28.237	30.060	26.244	-	26.244
Total Adjustments	-0.787	5.000	0.546	-	0.546
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	5.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.787	-			
• Adjustments to Budget Years	-	-	0.546	-	0.546
Congressional Add Details (\$ in Millions, and Includes General Reductions)					
Project: DW3: Army Geospatial Enterprise Implementation			FY 2019	FY 2020	
Congressional Add: Program Increase			-	5.000	
Congressional Add Subtotals for Project: DW3			-	5.000	
Congressional Add Totals for all Projects			-	5.000	

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605803A / Technical Information Activities					Project (Number/Name) 720 / Tech Info Func Actv			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
720: Tech Info Func Actv	-	4.616	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.616	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project provides funding for technology transfer activities to support acquisition, storage, and utilization of technical information for both military and domestic applications. Effective exploitation of science and technology (S&T) information is critical to achieving the goals established by senior Army leadership. Activities include: Army support for Federal Laboratory Consortium (FLC) as required by Public Law; the Army Science Board; the Army Science Conference; S&T database management efforts; and administration of the Army's Small Business Innovation Research (SBIR) and Small Business Technology Transfer Program (STTR) in accordance with the Small Business Innovation Development Act of 1982, the Small Business Research and Development Enhancement Act of 1992 and subsequent reauthorizing legislation. Technology transfer activities make technical information available to both the public and private sectors to reduce duplication in Research and Development programs and to increase competitiveness in the United States (U.S.) business community. Database management efforts support development of decision aids, databases, and automation support for the management and execution of the Army Research, Development, Test and Evaluation (RDTE) appropriation. In addition, this Project provides funding for patent legal expenses and fees for all U.S. Army Research, Development, and Engineering Command (RDECOM) subordinate commands and laboratories, as required by the Omnibus Budget Reconciliation Act.

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Work is performed by RDECOM, Aberdeen Proving Ground, MD and the US Army Research Laboratory (ARL), Adelphi, MD.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Title: Provide Army Funding Support for Federal Laboratory Consortium as Required by Public Law 104-113	0.252	-	-
Description: Public Law 104-113 requires the Army to provide funding for the federal laboratory consortium which is a network of federal agencies that provide a platform where technologies can be strengthened and promoted to return dividends to our economy. Beginning in Fiscal Year 2020, funding for the Federal Laboratory Consortium has been realigned to Project 727.			
Title: Provide Funding for Patent Fees and Patent Legal Expenses for U.S. Army Materiel Command (AMC) Commands and Laboratories	0.941	-	-
Description: The Army Research Laboratory turns high-value Army S&T investments into patented technologies in an effort to convert research into jobs and innovations for the Warfighter. The funded efforts are used for patent fees and legal expenses required for the patent application process.			
Title: Provide Funding for S&T Strategic Planning and Support	0.267	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>	Project (Number/Name) 720 / <i>Tech Info Func Actv</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	
<p>Description: S&T strategic planning and support is a critical component to the overall Army mission as it reaffirms Army leadership guidance, reinforces commitment to basic research, and leverages a landscape of game-changing technologies that can provide future innovations and capabilities to the Warfighter.</p>				
<p>Title: Administer S&T Database Computer Engineering Support Contract and Support RDECOM Databases S&T Management Support</p> <p>Description: The S&T database computer engineering support contract provides management support of RDECOM's databases as well as supports the development of the Army Research Laboratory S&T information activities to include campaign plans envisioned to lead to enhanced land power capabilities.</p>		1.922	-	
<p>Title: Administrative Support for the Army's SBIR and STTR Programs</p> <p>Description: Army SBIR and Army STTR programs. In 1982, Congress, through the Small Business Innovation Development Act (P.L. 97-219) established the SBIR program to foster the involvement of US based small businesses in federal research and development (R&D). The SBIR program is designed to increase the participation of small, high-technology firms in the federal R&D endeavor and give driven businesses the opportunity to provide innovative R&D solutions in response to critical Army needs. The STTR program expands the public/private sector partnership to include the joint venture opportunities for small business and the nation's premier nonprofit research institutions. The most important role of the STTR program is to foster the innovation necessary to meet the nation's scientific and technological challenges in the 21st century. The SBIR/STTR support services include program and technical advisory support services on a broad level. The Army SBIR/STTR Program Management Office mission requires synergized, integrated business solutions that concentrates on small business technological advances, and eliminates redundancy in a codified and consistent method that reduces confusion and ambiguity for the thousands of small businesses that participate in the SBIR and STTR programs.</p>		1.234	-	
Accomplishments/Planned Programs Subtotals		4.616	-	
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
N/A				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605803A / Technical Information Activities					Project (Number/Name) 727 / Tech Info Activities			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
727: Tech Info Activities	-	7.787	10.556	11.087	-	11.087	11.672	12.095	12.395	12.523	0.000	78.115	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds the oversight of science, research, and technology investments within the Department of the Army. These efforts include developing strategic direction, policy development, oversight and management of the Army's S&T portfolio including resource allocation. It includes contractor support required to implement a set of management decision aids, databases, and tools to support technical and budgetary decisions at the Department of the Army (DA). Additionally, covers the development and tracking of S&T metrics across the enterprise and supports development if Army plans, programs and policies for OSD and Congress. Most of the efforts in this project are on-going activities to support Army Research, Development, and Acquisition programs. Effective exploitation of Science and Technology (S&T) information is critical to achieving the goals established by Senior Army Leadership for the future force. Funding in this program supports Independent Review Team analysis of technology maturity as part of Technology Area Readiness Assessments.

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Work in this Project is performed by the Office of the Assistant Secretary of the Army, Acquisition, Logistics and Technology, The Pentagon, Washington, DC.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
<p>Title: Conduct and support S&T program portfolio assessments and analysis.</p> <p>Description: Supports identification, development and demonstration of technology options that inform and enable effective and affordable capabilities for the Soldier Providing Soldiers with the technology to win. Support Air, C3I, Ground Maneuver, Soldier, Basic Research and Lethality Portfolio Directors, responding to scientific, technical and programmatic challenges. Support Independent Review Team analysis of technology maturity as part of Technology Area Readiness Assessments. Serve as Office of the Deputy Assistant Secretary of the Army, Research and Technology (DASA(R&T)) central point of contact for S&T Metrics, Strategic Portfolio Analysis Review, evaluate technical risks, assess earned value and technical and financial health of S&T projects.</p> <p>FY 2020 Plans: Track, manage and provide programmatic support for applied research and advanced technology development efforts in vulnerability assessments; act as the S&T SMEs to provide Portfolio leads what is forecasted for science and technology ? outputs? to align with Programs of Record; provide ODASA (R&T) summary briefing in the Strategic Portfolio Analysis Review (SPAR); ensure tight alignment and coupling to existing PoRs and will identify where misalignment between Portfolio technology projections/timelines and/or emerging technology options are not yet reflected at the PoR level. Identify technology for effective</p>	0.170	2.256	4.100

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / Technical Information Activities	Project (Number/Name) 727 / Tech Info Activities		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
and affordable capabilities in the S&T portfolios: Basic Research; Innovation Enablers; Medical; Soldier/Squad; Command, Control, Communications, Computers and Intelligence (C3I); Air; Lethality; and Ground Maneuver.				
Conduct studies of emerging topics based on Army S&T strategy and senior leader initiatives through the Board on Army Science and Technology (BAST) and the National Academies.				
<p>FY 2021 Plans: Will track, manage and provide programmatic support for applied research and advanced technology development efforts across the Army modernization priorities; will act as the S&T SMEs to provide Portfolio leads what is forecasted for critical science and technology 'outputs' to align with Programs of Record; will ensure tight alignment and coupling to existing PoRs and will identify where misalignment between Portfolio technology projections/timelines and/or emerging technology options are not yet reflected at the PoR level. Will perform cross portfolio coordination and assessment; and evaluate and assess cost, schedule and technical progress against metrics to determine project health. Will assess progress of S&T projects, support Cross-functional team deep dives, evaluate technical risks and assess earned value for S&T projects. Will identify technology for effective and affordable capabilities in all the S&T portfolios: Basic Research; Medical; Soldier; Command, Control, Communications, Computers and Intelligence (C3I); Air; Lethality; and Ground Maneuver. Will conduct studies of merging topics based on Army S&T strategy and senior leader initiatives through the Board on Army Research and Development (BOARD) and the National Academies.</p>				
<p>FY 2020 to FY 2021 Increase/Decrease Statement: This increase is due to the alignment of resources to ASAALT to provide oversight and executive management of the entire Army S&T portfolio for resource allocation decisions supporting the S&T planning, programming and budget execution process.</p>				
<p>Title: Support Army S&T strategic planning, analysis, and prioritization.</p> <p>Description: Coordinates efforts with and across the Army S&T portfolios; manage proposal nomination and selection process; track and provide oversight of ongoing efforts; recommend resolutions/prioritization in the event of conflicting requirements and/or resource constraints; support the full spectrum of Planning, Programming and Budget Execution (PPBE) as it relates to the Army S&T Program. Provide senior level technical and analytical support for the Joint Capability Technology Demonstration (JCTD) program and Technology Maturation Initiative (TMI) by assisting with investment analysis, strategies and oversight. Provide financial management recommendations and insights with regards to JCTDs, TMI, Manufacturing Technology (ManTech) and Defense Manufacturing Initiatives. A variety of scientific and technical taxonomies applied at the task level allow responsive reporting on S&T programs to Congressional, OSD and Army leadership. Beginning in Fiscal Year 2020, funding for the Federal Laboratory Consortium has been realigned to this line of effort from Project 720.</p> <p>FY 2020 Plans:</p>				5.376 4.600 5.537

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020		
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)			
2040 / 6	PE 0605803A / Technical Information Activities	727 / Tech Info Activities			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019	FY 2020	FY 2021
Develop strategic analyses to look across the S&T portfolios and will provide recommendations to the Director of Integration for S&T efficiencies and collaborative opportunities; support ODASA(R&T) lead for future force; continue to coordinate efforts with and across the Army S&T portfolios; support the PDM process, tasks and guidance for Equipping PEG; develop prioritized decrement lists and recommend alternatives for a balanced portfolio; and support the plan and execution of the S&T Oversight Committees. Beginning in Fiscal Year 2020, funding for the Federal Laboratory Consortium has been realigned to this line of effort from Project 720.					
FY 2021 Plans: Will develop strategic analyses to look across the S&T portfolios and will provide recommendations to the Director of Integration for S&T efficiencies and collaborative opportunities; will ensure that resources align to strategy; will support S&T policy development; will support ODASA(R&T) lead for future force; will coordinate efforts within and across the Army S&T portfolios and engage in tri service leveraging; will support the PDM process, tasks and guidance for Equipping PEG; will develop prioritized decrement lists and recommend alternatives for a balanced portfolio; and will support the plan and execution of the S&T Oversight Committees. Evaluate projects within ManTech to support potential joint Service efforts and activities of Joint Defense ManTech. Support Army Prototyping Board planning and execution, and evaluation and tracking implementation of transition agreement policy.					
FY 2020 to FY 2021 Increase/Decrease Statement: This increase is due to the alignment of resources to ASAALT to provide strategic direction and ensure S&T investments are aligned to meet strategic goals.					
Title: Provide funding and support for Army Acquisition Program Technology Readiness Assessments for Program Milestone Decisions. Description: Coordination and alignment with Programs of Record. Demonstrate technical feasibility at system and subsystem level. As path for technology spirals to acquisition, ensure a rapid insertion of new technology.			1.268	1.000	1.250
FY 2020 Plans: Support the S&T investment strategy for the entire Army; provide options for the future across to sustain overmatch against adversaries and to create opportunities to meet new challenges and fight in new ways; continue Independent Review Team (IRT) analysis of technology maturity as part of Technology Readiness Assessments as required by DoDI 5000.2; and act as the central point of contact for Systems Red Teaming and Technology Vulnerability Assessments.					
FY 2021 Plans: Will support the S&T investment strategy for the entire Army; will provide options for the future across to sustain overmatch against adversaries and to create opportunities to meet new challenges and fight in new ways; will continue Independent Review Team (IRT) analysis of technology maturity as part of Technology Area Readiness Assessments; will provide oversight and					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>	Project (Number/Name) 727 / <i>Tech Info Activities</i>	
B. Accomplishments/Planned Programs (\$ in Millions) management of the Army's Technology Maturation Initiative; will develop and track S&T metrics across the enterprise; will identify S&T transitions in SPAR to identify follow-on funding requirements.		FY 2019	FY 2020
FY 2020 to FY 2021 Increase/Decrease Statement: This increase is due to the alignment of resources to ASAALT to track S&T metrics across the enterprise.			
Title: Provide Army support to Assistant Secretary of Defense for Research and Engineering Executive Staff for Department of Defense (DoD) wide Science and Technology oversight. Description: Supports Army engagement in DoD/Under Secretary of Defense for Research and Engineering and cross agency Communities of Interest (COI) and committees.		0.973	0.200
FY 2020 Plans: Participate in Defense Advanced Research Projects Agency (DARPA) engagements and awareness of DARPA Programs with links to Army S&T; support Army S&T Engagements with DARPA Program Managers and Leadership; and support execution of ongoing programs, events and functional responsibilities, effectively communicating with all Army stakeholders and partners including other services, OSD, industry and academia.			0.200
FY 2021 Plans: Participate in DoD Communities of Interest engagements and awareness of COI Programs with links to Army S&T; support Army S&T Engagements with USDRE Managers and Leadership; and support execution of ongoing programs, events and functional responsibilities, effectively communicating with all Army stakeholders and partners including other services, OSD, industry and academia.			
Title: Conduct and support technology wargaming Description: Crowd-sources future capabilities from the Army S&T enterprise, academia, and non-traditional DoD thinkers. Provides context and analysis on emerging national and international S&T trends in annual Emerging Trends report. Develops predictive technologies to identify disruptive technologies earlier. Analyzes international efforts in army S&T priorities and create a report to help inform decisions involving research partnerships.		-	2.094
FY 2020 Plans: Crowd-source future capabilities from the Army S&T enterprise, academia, and non-traditional DoD thinkers. Refine crowd-sourced efforts, adding Subject-Matter Expert review to create a functional decomposition of potential capabilities and analysis of potential technologies using bibliographic-based data analytics (universities, personnel, countries performing the research). Assign probabilities and perform Monte Carlo Simulation to create a here-to-there narrative for how basic science advances can produce an Army capability through a Technology Sequence Analysis (TSA). Implement a predictive technology tool, making it available to the S&T user base. Update international S&T report yearly, adding emerging S&T areas and dropping those that are			-

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / Technical Information Activities	Project (Number/Name) 727 / Tech Info Activities			
B. Accomplishments/Planned Programs (\$ in Millions) no longer army S&T priorities. Continue to update and provide context and analysis on emerging national and international S&T trends in annual Emerging Trends Report. FY 2020 to FY 2021 Increase/Decrease Statement: Effort complete in FY20.			FY 2019	FY 2020	FY 2021
Title: FY 2020 SBIR/STTR Transfer			-	0.406	-
Description: Funding transferred in accordance with Title 15 USC ?638					
FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638					
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638					
Accomplishments/Planned Programs Subtotals			7.787	10.556	11.087
C. Other Program Funding Summary (\$ in Millions)					
N/A					
Remarks					
D. Acquisition Strategy					
N/A					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605803A / Technical Information Activities				Project (Number/Name) 730 / Pers & Trng Analys Act				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
730: Pers & Trng Analys Act	-	1.317	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.317	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds the Army's behavioral and social science research in attitudes and opinions assessment, longitudinal trends in Soldier and leader perceptions, and emerging issues. The research provides a unique capability to address a number of issues that directly or indirectly affect Soldier and unit performance and readiness, such as identifying the impact of personnel policies on Soldier outcomes and identifying emerging and potential personnel challenges. Requirements for this research is solicited on a recurring basis from the Secretary of the Army (SA), Chief of Staff of the Army (CSA), Army Deputy Chief of Staff (DCS) G-1, and the Assistant Secretary of the Army for Manpower and Reserve Affairs (ASA (M&RA)).

Work in this Project is managed by the United States Army Research Institute for the Behavioral and Social Sciences (ARI), Ft. Belvoir, VA.

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

Title: PERS & TRNG ANALYS ACT											FY 2019	FY 2020	FY 2021
Description: This effort conducts attitude and opinion research to identify longitudinal trends and emerging issues to inform senior Army leader decision making and shape ARI's long-range S&T program.											1.317	-	-
Accomplishments/Planned Programs Subtotals											1.317	-	-

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

N/A

Remarks

D. Acquisition Strategy

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605803A / Technical Information Activities					Project (Number/Name) 731 / Army High Performance Computing Centers			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
731: Army High Performance Computing Centers	-	4.543	1.995	2.037	-	2.037	2.100	2.137	2.133	2.154	0.000	17.099	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project provides funding for the high performance computing (HPC) research environment, research, education, infrastructure sustainment, and outreach support associated with Army High Performance Computing Centers at the United States (U.S.) Army Combat Capabilities Development Command (CCDC), specifically, CCDC Army Research Laboratory (ARL) and CCDC Ground Vehicle Systems Center (GVSC). The Army High Performance Computing Centers provide high fidelity modeling, simulation, and analysis of materials, systems, and operational constructs. The Centers work with researchers at Army laboratories and research, development, and engineering centers to explore new HPC computing environments, algorithms in the computational sciences to address critical technology issues in computational research areas.

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Work is performed by ARL, Aberdeen Proving Ground, MD and GVSC, Warren, MI.

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

Title: Sustain the High Performance Computing Environment and Infrastructure in Support of the CCDC Army Research Laboratory (ARL)	FY 2019	FY 2020	FY 2021
Description: The HPC center provides levels of computational capacity to the Army's tactical operational realms and provide innovative HPC capabilities to increase the effectiveness of Army Soldiers around the world. Algorithm design and software engineering approaches are investigated to effectively partition and use binary processing cores to reduce time to solution for Army-relevant problems. Factors such as performance, portability, and power will be considered in conjunction with developing new models to quantify computing capabilities in hybrid systems to facilitate algorithm signature mapping to available resources.	4.543	1.904	2.037
FY 2020 Plans: Will support HPC environment and infrastructure by developing new methods for large-scale data processing needs and physics-based simulation applications. Sustain and port new software and legacy software to ensure compatibility with emerging computing systems, HPC networking, and visualization for mission critical applications. Sustain classified and above secret computing environments, providing application support for these special needs. Expand and support ARL Open Campus computational processing and simulation needs.			
FY 2021 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / Technical Information Activities	Project (Number/Name) 731 / Army High Performance Computing Centers			
B. Accomplishments/Planned Programs (\$ in Millions) Will support infrastructure, enabling hardware/software and other HPC capabilities while developing and implementing new methods for large-scale data analytic needs in addition to those associated with traditional physics -based simulation applications. Expand the customer base to non-traditional users to enable critical and highly impactful analyses of large and disparate data sets across all services. Sustain and expand the secret, above secret and special access computational environments according to emerging security and customer requirements. FY 2020 to FY 2021 Increase/Decrease Statement: Economic adjustment			FY 2019	FY 2020	FY 2021
Title: FY 2020 SBIR/STTR Transfer			-	0.091	-
Description: Funding transferred in accordance with Title 15 USC ?638					
FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638					
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638					
Accomplishments/Planned Programs Subtotals			4.543	1.995	2.037
C. Other Program Funding Summary (\$ in Millions)					
N/A					
Remarks					
D. Acquisition Strategy					
N/A					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605803A / Technical Information Activities					Project (Number/Name) 733 / Acquisition Tech Act			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
733: Acquisition Tech Act	-	3.412	9.278	4.800	-	4.800	4.867	4.942	5.009	5.122	0.000	37.430	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds improvements to the Army's acquisition programmatic and financial data by applying decision support and expert information systems, supporting analysis and evaluation of alternative acquisition strategies, and ability to measure effectiveness in meeting Army modernization strategy requirements. This Project provides the environment for the analysis and evaluation of new information technologies, concepts and applications for integrated management activities and supports the integration of technology to provide the Army Acquisition Executive with sound data for decision-making. This Project also supports critical analyses for Army senior leadership in support of Army Modernization efforts. These analyses are used by leadership in making acquisition, procurement, and logistics decisions in order to provide quality equipment to the Soldiers.

The cited work is consistent with the Under Secretary of Defense for Research and Engineering Science and Technology priority focus areas and the Army Modernization Strategy.

Work in this Project is performed by organizations within the Assistant Secretary of the Army (Acquisition, Logistics and Technology).

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
<p>Title: ACQUISITION TECH ACT</p> <p>Description: This effort will deploy and beta test application programs and user interface utilities for executive level information systems that offer Standard Query Language services to the Army Acquisition Executive corporate and Army databases. This effort will analyze an acquisition programs fiscal programming and budgeting requirements against enacted appropriations, conduct long range programming, planning and policy analysis, resource allocation analysis, cost tracking, and analysis. Robust requirements will then be transitioned to a Program Executive Officer for full implementation across the Program Executive Offices and respective Project and Product Management Offices.</p> <p>FY 2020 Plans: Establish and phase the implementation of an Integrated Program Management Environment framework that enables centralized, role-based access to trusted and authoritative data from disparate Acquisition Domain data sources. Beta-test an interim program management resource tool as a proof of concept pilot within the Army. This tool will be scaled and deployed across the Army Program Executive Offices to capture programmatic and financial data for acquisition programs of record and investments. Report progress to Army Acquisition Executive for go/no-go decision to fully implement.</p> <p>FY 2021 Plans:</p>	3.412	8.857	4.800

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / Technical Information Activities	Project (Number/Name) 733 / Acquisition Tech Act		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
Upon decision by the Army Acquisition Executive, continue the phased implementation of the Program Management Environment framework to incorporate acquisition metrics to measure the progress of all Army acquisition programs and investment efforts. This project will allow organizations within the Army Acquisition Executive and Army Staff to quickly access acquisition programmatic or financial information needed without the necessary burden to a program office for data calls. This is the continuation of a deliberate effort to build a larger acquisition domain which will capture and utilize acquisition programs data from concept to divestiture.				
FY 2020 to FY 2021 Increase/Decrease Statement: Funds realigned to support higher priority requirements consistent with Army Modernization strategy.				
Title: FY 2020 SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC ?638				- 0.421 -
FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638				
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638				
Accomplishments/Planned Programs Subtotals				3.412 9.278 4.800
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
N/A				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605803A / Technical Information Activities					Project (Number/Name) C16 / FAST			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
C16: FAST	-	1.602	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.602	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project provides support for the Field Assistance in Science and Technology (FAST) program. The FAST program provides Science Advisors, recruited from Army Materiel Command (AMC) headquarters and all Major Subordinate Commands (MSC) to serve combatant commands and major commands worldwide. FAST tours of duty provide significant professional growth opportunities for the Army's scientists and engineers and enable them to focus AMC resources on rapidly identifying and solving field technical problems that enable the improvement of readiness, safety, training, and reduce operations and support (O&S) costs. The FAST activity is supported by Quick Reaction Coordinators within the engineering centers. The FAST program recoups many times its cost in O&S savings. FAST also provides emerging technology demonstration opportunities to the engineering centers an Annual Program Review to facilitate sharing of lessons learned between science advisors at combatant commands, assists Combatant Commanders (COCOMS) with their annual Science and Technology Conferences. FAST also maintains close coordination with the Navy Science Advisor Program (Naval Fleet Forces Technology Integration Office). FAST supports warfighters in contingency operations with embedded Science and Technology Assistance Teams (STATs) as well as Science and Technology Acquisition Corps Advisors (STACAs).

The cited work is consistent with the Under Secretary of Defense for Research and Engineering Science and Technology priority focus areas and the Army Modernization Strategy.

Work in this project is performed by: AMC, Redstone Arsenal, AL; and Research, Development and Engineering Command (RDECOM), Aberdeen Proving Ground, MD.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Title: Respond to combatant commanders worldwide with technological solutions.	1.602	-	-
Description: This activity: responds to combatant commanders worldwide with technological solutions to urgent materiel problems they identify; deploys science advisors with U.S. Task Forces in support of combatant commanders; executes annual Program Review; provides additional support needed to participate in combatant commander exercises; responds to corresponding Warfighter requests for information (RFIs), providing project support to offset capability gaps identified by the Warfighter.			
Accomplishments/Planned Programs Subtotals		1.602	-

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

N/A

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army	Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / <i>Technical Information Activities</i>	Project (Number/Name) C16 / FAST
D. Acquisition Strategy N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605803A / Technical Information Activities					Project (Number/Name) C18 / BAST			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
C18: BAST	-	1.865	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.865	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification													
This Project funds the Board on Army Science and Technology (BAST). The BAST functions under the auspices of the National Research Council (NRC) and provides an external, independent, and objective source of advice to the Army. The BAST serves as a convening authority for the discussion of science and technology issues of importance to the Army and oversees independent Army-related studies conducted by the National Academies. Working in close coordination with the Army, the BAST helps define problems, brings together experts to study these problems, and provides recommendations. Committees are assembled in accordance with established NRC procedures and BAST studies often take 12 months or more to conclude.													
The cited work is consistent with the Under Secretary of Defense for Research and Engineering science and technology priority focus areas and the Army Modernization Strategy.													
Work in this Project is executed extramurally by the U.S. Army Research Laboratory, Army Research Office (ARO), Research Triangle Park, NC.													
B. Accomplishments/Planned Programs (\$ in Millions)											FY 2019	FY 2020	FY 2021
Title: Provide Studies and Conduct Periodic Meetings to Help Identify, Assess, and Recommend Emerging Opportunities in Science and Technology (S&T) Fields Applicable to the United States (U.S.) Army											1.865	-	-
Description: To acquire a greater understanding of emerging technology opportunities that support a plethora of Army-relevant capability gaps, technologies are continuously assessed both nationally and internationally. In addition, periodic meetings are conducted to discuss and recommend strategic research areas critical to advancing the Warfighter's capabilities.													
Accomplishments/Planned Programs Subtotals											1.865	-	-
C. Other Program Funding Summary (\$ in Millions)													
N/A													
Remarks													
D. Acquisition Strategy													
N/A													

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605803A / Technical Information Activities					Project (Number/Name) CC2 / Expeditionary Technologies			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
CC2: Expeditionary Technologies	-	0.000	0.000	5.000	-	5.000	0.000	0.000	0.000	0.000	0.000	5.000	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

Note

In FY2021 this project is being realigned from:

- Program Element 0605801A Medical Command Support
- * Project MO2 Med Cmd Spt (Non-AMHA)
- Program Element GZ2400 Bradley Modification program

A. Mission Description and Budget Item Justification

This Project evaluates the feasibility and potential application of disruptive technologies to Army capability gaps. Expeditionary Technology Search (xTechSearch) partners with small, non-traditional companies to apply novel techniques and applications to Army problems through a non-dilutive prize competitions, business accelerators, and outreach activities. These programs will uncover novel dual-use technology solutions that otherwise would not be identified by the Department of Defense.

Work in this Project is performed by the United States Army Futures Command.

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Title: Expeditionary Technology Search (xTechSearch)	-	-	5.000
Description: Funds technical scouting and competition in Army-wide disciplines through rigorous technical assessment, Soldier feedback, mentorship sponsoring, and cash prizes.			
FY 2021 Plans: Conduct biannual competitions with small, non-traditional companies seeking to apply their product or idea towards a prescribed focus area.			
FY 2020 to FY 2021 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / Technical Information Activities	Project (Number/Name) CC2 / Expeditionary Technologies		
B. Accomplishments/Planned Programs (\$ in Millions) FY2021 funds have been realigned from Program Element 0605801A Medical Command Support, Project MO2 Med Cmd Spt (Non-AMHA) and Program Element GZ2400 Bradley Modification Program.		FY 2019	FY 2020	FY 2021
Accomplishments/Planned Programs Subtotals		-	-	5.000
C. Other Program Funding Summary (\$ in Millions)				
N/A				
<u>Remarks</u>				
D. Acquisition Strategy				
N/A				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 6					PE 0605803A / Technical Information Activities				DW3 / Army Geospatial Enterprise Implementation				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
DW3: Army Geospatial Enterprise Implementation	-	3.095	8.231	3.320	-	3.320	3.393	3.401	3.581	3.650	0.000	28.671	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification		
<p>This Project provides geospatial domain expertise to Mission Command (MC) in implementing the Army Geospatial Enterprise (AGE) across all MC Systems to ensure interoperability across the Army, with National Agencies and UAP partners; ensures Army systems can consume geospatial data from National-Geospatial Intelligence Agency (NGA) and with National System for Geospatial-Intelligence (NSG) partners as required by Department of Defense Instruction (DoDI) 5000.56; standardizes geospatial data between echelons and ensures Standard, Sharable Geospatial Foundation (a Mission Command Essential Capability) across Mission Command; and sustains core mission of operations. Project enables an interoperable geospatial baseline system of systems in theater, which is a near-term requirement that cannot be deferred. Geospatial is a Mission Command Essential Capability and a critical enabler for the Common Operating Environment (COE), Army modernization and the warfighter.</p>		

B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019	FY 2020	FY 2021
Title: Enterprise Support Branch (formerly Geospatial Acquisition Support Office)	3.095	3.156	3.320		
Description: This effort provides the geospatial systems engineering, architecture, and test and certification required to ensure Army Acquisition Systems meet Program Executive Office (PEO)/Program Manager (PM) and Common Operating Environment (COE) geospatial requirements which ensure geospatial interoperability across Mission Command and with our National and UAP partners; Develops new geospatial standards and evaluates emerging geospatial technologies early in their development processes to enable an interoperable geospatial baseline system of systems in theater, which is a near-term requirement that cannot be deferred.					

FY 2020 Plans:
Will continue to extend the AGE implementation within the Command Post Computing Environment, Mounted and Mobile Hand-Held CE's; continue to develop alternatives for providing Standard, Sharable Geospatial Foundation (a Mission Command Essential Capability) to Mission Command Systems in a disconnected, Intermittent or Limited environment; develop and recommend standards to distribute SSGF from National to Tactical; initiate implementation AGE roadmap for Mission Command ensuring interoperability between Mission Command systems, the NSG, and our UAP partners; and provide geospatial domain expertise for Army modernization and enabling technologies of the Common Operating Environment.

FY 2021 Plans:
Will extend AGE within the Command Post Computing Environment, Mounted and Mobile Hand-Held CE's and to support Army modernization; develop and promulgate geospatial standards and technology alternatives for providing Standard, Sharable

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605803A / Technical Information Activities	Project (Number/Name) DW3 / Army Geospatial Enterprise Implementation	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020
Geospatial Foundation (a Mission Command Essential Capability) to Mission Command Systems in a disconnected, Intermittent or Limited environment; develop and recommend technologies and processes to provide an interoperable 2D and 3D SSGF from National to Tactical; continue to execute roadmap to enable geospatial interoperability between Mission Command systems, the NSG, and our UAP partners; and provide geospatial domain expertise for Mission Command, Army modernization and enabling technologies of the Common Operating Environment.			
FY 2020 to FY 2021 Increase/Decrease Statement: FY20 to FY21 increases are due to programmed inflation.			
Title: FY 2020 SBIR/STTR Transfer	-	0.075	-
Description: Funding transferred in accordance with Title 15 USC ?638			
FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals			3.095
Congressional Add: Program Increase			5.000
FY 2020 Plans: Program Increase			
Congressional Adds Subtotals			5.000
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0605805A / Munitions Standardization, Effectiveness and Safety							
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	66.678	54.458	40.133	-	40.133	41.518	41.425	42.420	42.692	0.000	329.324
297: Mun Survivability & Log	-	16.027	15.595	16.346	-	16.346	17.046	17.023	17.231	17.286	0.000	116.554
857: DoD Explosives Safety Standards	-	1.781	1.858	0.000	-	0.000	0.000	0.000	0.000	0.003	0.000	3.642
858: Army Explosives Safety Management Program	-	0.959	1.011	1.029	-	1.029	1.046	1.078	1.075	1.086	0.000	7.284
859: Life Cycle Pilot Process	-	31.235	10.600	5.695	-	5.695	5.795	5.895	5.894	5.920	0.000	71.034
F21: NATO Ammo Evaluation	-	0.650	0.750	0.749	-	0.749	0.749	0.749	0.749	0.749	0.000	5.145
F24: Conventional Munitions Demil	-	16.026	24.644	16.314	-	16.314	16.882	16.680	17.471	17.648	0.000	125.665
A. Mission Description and Budget Item Justification												
This Program Element (PE) supports continuing technology investigations by providing a coordinated Tri-Service mechanism for the collection and free exchange of technical data on the performance and effectiveness of all non-nuclear conventional munitions and weapons systems in a realistic operational environment.												
Project 296 - This Project will support research, development and testing to identify, characterize and resolve reliability, safety, storage and manufacturing issues that impact production availability and field use of demolitions, grenades, shoulder launched munitions, mines and mine clearing charges and pyrotechnics, including training realism. Project will result in the development and demonstration of new, safe, reliable and environmentally acceptable munitions.												
Project 297 - Munitions Survivability & Logistics: This Project supports the future force by making Army units more survivable through the investigation, testing and demonstration of munitions logistics system improvements that prevent or minimize catastrophic explosive events and accelerate ammunition resupply. Key thrusts are munitions storage area survivability, Inert Munitions (IM) technology integration and compliance, ammunition management and asset visibility, weapon system rearm, munitions configured load enablers and advanced packaging and distribution system enhancements. Within each thrust, a broad array of solutions will be identified, tested, and evaluated against developed system measures of effectiveness. Optimum, cost effective and efficient solutions that enable the rapid projection of lethal and survivable forces will be demonstrated. The early stages of force deployment are especially critical. Theater ammunition storage areas are vulnerable and present the enemy with lucrative targets. These areas and distribution nodes contain the only available munitions stocks in theater. Loss of these munition stocks could cripple the force, jeopardize the mission, and result in high loss of life. This Project mitigates vulnerabilities and ensures a survivable fighting force.												
Project 857 - DoD Explosives Safety Standards: This Project supports the Research, Development, Test, and Evaluation efforts of the Department of Defense (DoD) Explosive Safety Standards Board. It supports explosive safety effects research and testing to quantify hazards and to develop techniques to mitigate those hazards in all DoD manufacturing, testing, transportation, maintenance, storage, disposal of ammunition and explosives operations, and also to develop risk based explosives												

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army		Date: February 2020		
Appropriation/Budget Activity	R-1 Program Element (Number/Name)			
2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>			
safety standards. Results are essential to the development and improvement of quantity-distance standards, hazard classification procedures, cost effective explosion-resistant facility design procedures, and personnel hazard/protection criteria.				
Project 858 - Army Explosives Safety Management Program: This Project establishes, validates or modifies explosives technical safety requirements per Department of Defense Manual 6055.09 and Department of the Army Pamphlet 385-64, Ammunition and Explosives Safety Standards. Project activities promote Research, Development, Test, and Evaluation (RDTE) of new and innovative explosives safety technologies that improve the survivability of Army personnel, facilities, and equipment as well as improve the health, safety and welfare of the general public (with highest priority directed to combat theater of operations).				
Project 859 - Life Cycle Pilot Process: This Project supports the implementation of the Single Manager for Conventional Ammunition (SMCA) Industrial Base Strategic Plan through technology investigations, model based process controls, pilot prototyping, and industrial assessments. It will assess life cycle production capabilities required for all ammunition families, address design for manufacturability to facilitate economical production, identify industrial and technology requirements, and address the ability of the production base to rapidly and cost effectively produce quality products. Cost reduction is an important part of the Life Cycle Pilot Process (LCPP). LCPP provides the resources to prototype critical technologies and develop the knowledge base to establish cost effective, environmentally safe and modern production processes in support of the munitions Industrial Base transformation. In addition, the LCPP program addresses Single Point Failures (SPFs) / No Source of supply within the National Technology Industrial Base (NTIB). LCPP provides support to reduce supply chain risk by investigating, developing and evaluating additional sources of supply for a known SPF.				
Project F21: The North Atlantic Treaty Organization (NATO) Ammunition Evaluation program funding ensures interchangeability of direct fire ammunition and weapons among all the NATO countries with all of the associated logistic, strategic and tactical advantages of the alliance. The Project involves development and testing compliance of NATO standardization agreements (STANAGS) and staffing of the North American Regional Test Center (NARTC). In addition, this Project supports small caliber ammunition, 40mm grenade munitions, medium caliber cannon ammunition, and large caliber ammunition enhancements to lethality, effectiveness, survivability, accuracy, and general product improvements. This Project also supports the standardization and interchangeability of legacy and new production U.S. weapons and ammunition with Allied Nations to maximize battlefield interchangeability/compatibility under the auspices of international agreements to include NATO working groups, the Joint Ballistics Memorandum Of Understanding (JBMOU), and information/ data exchange agreements. Maximizing standardization, interchangeability, and exportability will also potentially increase Foreign Military Sales (FMS) of U.S. indirect fire Weapon and Munition products to support United States industrial base production and affordable Department of Defense pricing through increased economies of scale. FY 2021 funding will support NATO and JBMOU artillery and small arms ammunition interchangeability group meetings, documentation, and test operations.				
Project F24: Conventional Munitions Demilitarization (Demil): The Conventional Munitions Demilitarization technology Project supports the Single Manager for Conventional Ammunition (SMCA) responsibility per Department of Defense Instruction (DoDI) 5160.68 to plan, program, budget and fund a Joint Service Research and Development (R&D) program that develops capability and capacity as well as technology and facilities to support the SMCA mission to demil and dispose of conventional ammunition stored in the SMCA Resource, Recovery and Disposition Account (B5A). The program goals include SMCA efforts to increase efficiencies and effectiveness to reduce the demil stockpile; reduce processing costs including packaging, handling and crating; and increase capacity through improved demilitarization capabilities and processes. Project F24 includes activities: (1) to establish requirements and develop processes to focus investments, assess capabilities, analyze alternatives, and recommend and implement R&D projects; (2) to improve products and processes that support existing capabilities; (3) to develop or improve demil				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army		Date: February 2020			
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support		PE 0605805A / Munitions Standardization, Effectiveness and Safety			
methods and processes related to advance the primary demilitarization core thrust areas of destruction, disassembly, removal, resource recovery and recycling, and waste stream treatment; (4) to ensure safe and environmentally acceptable demil operations; (5) to transition R&D products to United States Army depots or plants as well as commercial facilities performing demil; and (6) to mitigate risk and close-out project activities.					
B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	72.279	44.458	42.064	-	42.064
Current President's Budget	66.678	54.458	40.133	-	40.133
Total Adjustments	-5.601	10.000	-1.931	-	-1.931
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	10.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-4.091	-			
• SBIR/STTR Transfer	-1.510	-			
• Adjustments to Budget Years	-	-	-1.931	-	-1.931
Congressional Add Details (\$ in Millions, and Includes General Reductions)	FY 2019	FY 2020			
Project: 859: Life Cycle Pilot Process					
Congressional Add: Congressional Add	26.000	5.000			
Congressional Add Subtotals for Project: 859	26.000	5.000			
Congressional Add Totals for all Projects	26.000	5.000			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605805A / Munitions Standardization, Effectiveness and Safety				Project (Number/Name) 297 / Mun Survivability & Log				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
297: Mun Survivability & Log	-	16.027	15.595	16.346	-	16.346	17.046	17.023	17.231	17.286	0.000	116.554	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project supports the future force by making Army units more survivable through the investigation, testing and demonstration of munitions logistics system improvements that prevent or minimize catastrophic explosive events and accelerate ammunition resupply. Key thrust areas are munitions storage area survivability, Inensitive Munitions (IM) technology integration and compliance, ammunition management and asset visibility, weapon system rearm, munitions configured load enablers, advanced packaging and distribution system enhancements, improved estimation and future prediction of munitions reliability. Within each thrust area, a broad array of solutions will be identified, tested, and evaluated against developed system measures of effectiveness. Optimum, cost effective and efficient solutions that enable the rapid projection of lethal and survivable forces will be demonstrated. The early stages of force deployment are especially critical. Theater ammunition storage areas are vulnerable and present the enemy with lucrative targets. These areas and distribution nodes contain the only available munitions stocks in theater. Loss of these munition stocks could cripple the force, jeopardize the mission, and result in high loss of life. This Project mitigates vulnerabilities and ensures a survivable fighting force. All research and development initiatives will be supporting the cross functional teams and the multi domain operations modernization objectives.

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

	FY 2019	FY 2020	FY 2021
Title: Munitions Predictive Life	1.378	1.083	1.352
Description: This activity will demonstrate technologies and algorithms that can help assess munitions serviceability based upon aggregate environmental exposures, system cycling and munition degradation models. The activity will provide life cycle management tools for risk mitigation strategies, while reducing testing, inspection & surveillance required as well as improving weapon system reliability and warfighter effectiveness.			
FY 2020 Plans: Demonstrate concept of operations of an integrated second generation ammunition container based temperature/humidity exposure reliability sensor. Demonstrate Multi Frequency Sensor Suite in a training environment that will monitor exposure to ambient radiation over their lifecycle with legacy ammunition items. Support qualification testing and required modifications of passive time/temperature exposure sensor. Conduct additional correlation testing on legacy ammunition items to prepare for broader stockpile integration. Conduct market survey of passive Radio Frequency Identification and low cost active environmental sensors for legacy munitions, select and test viable candidates. Conduct sensitivity analysis of near-real time propellant temperature on ballistic solutions. Incorporate munition monitoring technologies into demonstrations.			
FY 2021 Plans: Demonstrate improved performance of an integrated reduced footprint temperature/humidity exposure reliability sensor. Demonstrate lower cost alternative accelerometer design for Remote Readiness Asset Prognostic/Diagnostic System (RRAPDS).			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / Munitions Standardization, Effectiveness and Safety	Project (Number/Name) 297 / Mun Survivability & Log			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019	FY 2020	FY 2021
Conduct recurring market surveys of emerging passive Radio Frequency Identification technologies and active and passive environmental sensors for legacy munitions, select and test viable candidates. Evaluate potential for propellant temperature sensors on additional munitions. Incorporate munition monitoring technologies into an operational demonstration. Evaluate lead free solder based circuit card assembly alternatives.					
FY 2020 to FY 2021 Increase/Decrease Statement: The slight increase from FY 2020 to FY 2021 is due to labor rate increases.					
Title: Insensitive Munitions (IM) Integration Program Description: Demonstrate multiple IM technologies and integrate into end item(s) to improve munitions survivability and warfighter safety. IM Technologies, using State-of-the-Art materials, will be developed in the areas of warhead, propulsion and propellants, explosives, packaging, and barriers. In addition, modeling and simulation will be used to reduce development and testing costs. Efforts will increase the number of IM compliant ammunition items fielded to mitigate munitions reaction to unplanned stimuli such as fire, fragments, enclosed heat build-up (cook-off), bullets, adjacent munitions reaction (sympathetic detonation), and shape charge jet attacks. FY 2020 Plans: Conduct end item testing of a high energy pressed explosives to replace Composition A5 to reduce the reaction violence from shock and slow heating. Continue development of medium caliber, foamed celluloid cartridge cases to create a novel venting solution for shock and thermal events. Conduct fragment impact testing on new igniter formulations to replace Benite in 120mm tank munitions. Perform Insensitive Munitions (IM) testing on the M433E1 40MM Cartridge to integrate technologies for warhead and packaging venting along with impact mitigation technologies. Continue optimization of plastic packaging containers for large caliber munitions to mitigate both fast and slow cook-off events. FY 2021 Plans: Complete end item testing of high energy pressed explosives to replace Comp A5 for improved reaction violence to shock and slow heating. Demonstrate medium caliber, foamed celluloid cartridge cases for improved response to shock and thermal threats in support of Next Generation Combat Vehicle (NGCV), Future Vertical Lift (FVL) and Soldier Lethality (SL) modernization priorities. Complete fragment impact testing on new igniter formulations to replace Benite in 120mm tank munitions. Perform Insensitive Munitions (IM) testing on the M433E1 40MM Cartridge to integrate explosive technology along with warhead, packaging venting and impact mitigation technologies. Continue development of Dinitropyrazole (DNP) based formulation in 120mm mortar for improved IM and lethality to support of Long Range Precision Fires (LRPF) modernization priority. Optimize DNP formulation with added nitramines, for an improved Insensitive Munitions (IM) formulation that matched Polymer Based Explosive (PBXN-110) performance. Continue to develop Lab Resonance Acoustic Mixing (RAM) technology to coat nanonitramine formulations for improved shock sensitivity at reduced cost to support Long Range Precision Fires (LRPF) and Air	6.321	6.568	6.851		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / Munitions Standardization, Effectiveness and Safety	Project (Number/Name) 297 / Mun Survivability & Log			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019	FY 2020	FY 2021
and Missile Defense (AMD) priorities. Demonstrate optimized plastic containers for large caliber munitions to mitigate both fast and slow cook-off events. Conduct final testing of the non-deforming packaging configurations to prevent mass detonation events in tightly-packed medium caliber munitions. Complete development of deflection plate technology for an integrated packaged design.					
FY 2020 to FY 2021 Increase/Decrease Statement: Slight increase from FY 2020 to FY 2021 is due to labor rate increases.					
Title: Improved Munitions Packaging Description: This activity will demonstrate upgrades to existing packaging components and materials to improve legacy ammunition survivability. These upgrades will enhance ammunition survivability and reliability, improve field ammunition operations, and improve packaging. FY 2020 Plans: Develop prototypes and perform engineering testing for the Rapid Access Container Consolidator (RACC) program for the transportation of M2A2 containers. Perform engineering and verification testing on the Bulk Pack Container program for 7.62MM linked ammunition and continue to facilitate implementation of new design with Lake City Army Ammunition Plant (LCAAP). Continue to conduct verification testing on injection molded cylindrical container for integration with the M829A4 120mm tank ammunition. Conduct qualification testing for the plastic rectangular container to integrate it for use with legacy 5.56mm small caliber ammunition. Conduct engineering and prototype testing on injection molded plastic mortar container for integration with 120mm mortar munitions. Conduct engineering testing on the lightweight M2A2 container as part of the Lighten the Load program for use on small caliber ammunition. FY 2021 Plans: Conduct verification testing for the Rapid Access Container Consolidator (RACC) program for the transportation of M2A2 containers. Conduct engineering and verification testing for the plastic rectangular container to integrate it for use with the next generation weapon systems. Conduct verification testing on injection molded plastic mortar container for the family of 120mm mortars. Conduct verification testing on the lightweight steel M2A2 container as part of the Lighten the Load program for use with the next generation weapon system. Conduct verification testing on the M548 Tracked Cargo Carrier container with embossed rub-rail for small and medium caliber ammunition. Conduct pallet testing as part of the undervalued hardwood program. Conduct testing and initial user assessment of a standardized wall breaching kit, sled for movement of 2.75? rockets and linked ammunition container enhancements designed for Special Forces operations.					
FY 2020 to FY 2021 Increase/Decrease Statement:					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / Munitions Standardization, Effectiveness and Safety	Project (Number/Name) 297 / Mun Survivability & Log			
B. Accomplishments/Planned Programs (\$ in Millions) Increase due to amount of verification testing required on families of items.			FY 2019	FY 2020	FY 2021
Title: Ammo Provider			5.252	5.280	5.463
Description: This activity demonstrates technologies that will assure a survivable munitions logistics system by increasing distribution velocity and protecting ammo storage areas. Technology areas to be investigated include ammunition asset visibility, including environmental sensors, marking technologies, and supply chain modeling; ammunition management, including improvements in stockpile surveillance and condition based management; sustainment, including pre-configured loads (soldier to unit size); field ammo reconfiguration capability, robotic handling, and improved load building capability; and force protection, including site planning software and field storage protection.					
FY 2020 Plans: Demonstrate multiple improved ammunition logistics enablers including Ammunition Quality Decision Tool, Configured Load Building Tool, Material Handling Equipment (MHE) interface kit and Class V Adaptive Demand Estimation System (CADES), integrated through Cognitive Automated Supply Point Enhanced Robotics (CASPER), within Automated Supply Point-Scalable (ASP-S). Perform testing and initial user assessment for continued development of integrated round counting sensor device. Facilitates anticipatory resupply by enabling automatic reporting of quantity and type of fired ammunition through signature analysis from small and medium caliber weapon systems. Support continued development and field trials of Distribution and Retrograde Adaptive planning and execution Management (DRAM) and Class V Adaptive Demand Estimation System (CADES) prototypes through operational demonstrations. Develop artificial intelligence and mechanical systems to facilitate the turn in, inspection, and retrograde of small to medium caliber ammunition in forward tactical environments. Continue development and conduct incremental operational assessment of expeditionary Munitions Survivability Software enhance Mobile Satellite Services (eMSS) enhancements.					
FY 2021 Plans: Continue incremental development and user evaluations of the Class V Adaptive Demand Estimation System (CADES) prototype to demonstrate increasingly complex capabilities to include support of multi-vessel ammunition call forward planning and establishing theater wide stock objectives. Develop expeditionary Munitions Survivability Software (eMSS) capabilities to support disconnected operations, continue executing extended user evaluations and compile documentation to support transition to a Product Manager. Support continued validation of the Distribution and Retrograde Adaptive planning and execution Management (DRAM) prototype to prepare for transition. Perform initial user evaluations of the Configured Load Building Tool (CLBT) capability supplemented with augmented reality technology to enable more efficient load building. Receive prototype Loose Ammo Turn In capability and conduct tactical testing in representative environments. Complete development and initiate testing of a capability for rapidly capturing the interior layout of an ammunition storage magazine in three dimensions to enable more efficient management of the ammunition stockpile. Complete testing and demonstration of the Ammunition Quality Decision Tool in preparation for transition to the Army Ammunition Enterprise. Improve logistics performance by exploiting man-machine teaming					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / Munitions Standardization, Effectiveness and Safety	Project (Number/Name) 297 / Mun Survivability & Log		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
to provide supervisory control capabilities for workload tasking in an ammunition storage node. Develop technologies to facilitate the turn in, inspection, and retrograde of small to medium caliber ammunition in forward tactical environments. Provide support to year 3 of the Unmanned Logistics System ? Air (ULS-A) JCTD.				
FY 2020 to FY 2021 Increase/Decrease Statement: Funding change reflects planned lifecycle of this effort.				
Title: FY 2020 SBIR/STTR Transfer		-	0.708	-
Description: Funding transferred in accordance with Title 15 USC 638				
FY 2020 Plans: Funding transferred in accordance with Title 15 USC 638				
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638				
Accomplishments/Planned Programs Subtotals		16.027	15.595	16.346
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
N/A				

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605805A / Munitions Standardization, Effectiveness and Safety				Project (Number/Name) 857 / DoD Explosives Safety Standards				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
857: DoD Explosives Safety Standards	-	1.781	1.858	0.000	-	0.000	0.000	0.000	0.000	0.003	0.000	3.642	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

Note
In Fiscal Year 2021 (FY21) this Project is Eliminated.

A. Mission Description and Budget Item Justification
This Program Element (PE) supports continuing technology investigations. It provides a coordinated tri-Service mechanism for the collection and free exchange of technical data on the performance and effectiveness of all non-nuclear conventional munitions and weapons systems in a realistic operational environment.

Project 857 - DoD Explosives Safety Standards: This Project supports the Research, Development, Test, and Evaluation efforts of the Department of Defense (DoD) Explosive Safety Standards Board. It supports explosive safety effects research and testing to quantify hazards and to develop techniques to mitigate those hazards in all DoD manufacturing, testing, transportation, maintenance, storage, disposal of ammunition and explosives operations, and also to develop risk based explosives safety standards. Results are essential to the development and improvement of quantity-distance standards, hazard classification procedures, cost effective explosion resistant facility design procedures, and personnel hazard/protection criteria.

This Project supports the Research, Development, Test, & Evaluation (RDTE) efforts of the Department of Defense (DoD) Explosive Safety Standards Board. It supports explosive safety effects research and testing to quantify hazards and to develop techniques to mitigate those hazards in all DoD manufacturing, testing, transportation, maintenance, storage, disposal of ammunition and explosives operations, and also to develop risk based explosives safety standards. Results are essential to the development and improvement of quantity-distance standards, hazard classification procedures, cost effective explosion resistant facility design procedures, and personnel hazard/protection criteria.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Title: Explosive and Munitions Tests Description: Testing aimed at solving practical problems and increasing predictability of the effects of explosions and impacts on people, materials and structures. Additionally, testing provides data on the interaction of explosives in various configurations. Testing results are used to improve predictability of effects from explosive incidents and improve criteria to protect people, structures and the environment from the damaging effects of DoD munitions.	1.056	1.089	-
FY 2020 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / Munitions Standardization, Effectiveness and Safety	Project (Number/Name) 857 / DoD Explosives Safety Standards	
B. Accomplishments/Planned Programs (\$ in Millions) Conduct scaled and full-scale testing of earth-covered magazines, and continue test program to characterize thermal/combustion hazards in explosives storage and operating facilities and develop models to predict these hazards.			FY 2019
FY 2020 to FY 2021 Increase/Decrease Statement: There was no FY 2021 funding requested for this effort.			FY 2020
Title: Explosive Safety Standards (ESS) Implementation Methodologies & Tools		0.375	0.361
Description: Provide tools to support site planning and risk assessment in the garrison and contingency environments. Provide tools and improvements for United Facilities Criteria, Structures to Resist the Effects of Accidental Explosions (UFC 3-340-02) and substantial dividing wall criteria. Provide methodologies and tools to perform site-specific analyses, databases for critical explosives safety information, and standardized designs to reduce design costs. Develop models to predict response for large scale explosion effects.			-
FY 2020 Plans: Finalize transition of Explosive Safety Standards (ESS) to web hosting, with full capability for quantity-distance and risk-based siting of explosives facilities Department of Defense (DoD) wide. Develop expanded suite of tools to meet diverse needs of the DoD explosives safety community.			FY 2021
FY 2020 to FY 2021 Increase/Decrease Statement: No FY 2021 funding requested for this effort.			
Title: Standard Development & Improvement		0.350	0.324
Description: Improve and revise all DoD Explosives Safety Standards (for hazard classification, quantity distance, and protective construction) to keep them current with changing technology and incorporate knowledge gained from the testing program. Shape and leverage with international community (NATO & UN). Develop Advanced (e.g. risk-based) siting criteria.			-
FY 2020 Plans: Pursue update of North Atlantic Treaty Organization (NATO) criteria to better address debris and thermal hazards from explosives, as indicated by results of multi-year US test and modeling programs. Incorporate test results of earth-covered magazine blast load testing into Department of Defense Manual (DoDM 6055.09), DoD Ammunition and Explosives Safety Standards and United Facilities Criteria, Structures to Resist the Effects of Accidental Explosions (UFC 3-340-02).			
FY 2020 to FY 2021 Increase/Decrease Statement: No FY 2021 funding requested for this effort.			
Title: FY 2020 SBIR/STTR Transfer		-	0.084

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>	Project (Number/Name) 857 / <i>DoD Explosives Safety Standards</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020
Description: Funding transferred in accordance with Title 15 USC 638			
FY 2020 Plans: Funding transferred in accordance with Title 15 USC 638			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638			
Accomplishments/Planned Programs Subtotals		1.781	1.858
			-
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605805A / Munitions Standardization, Effectiveness and Safety					Project (Number/Name) 858 / Army Explosives Safety Management Program			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
858: Army Explosives Safety Management Program	-	0.959	1.011	1.029	-	1.029	1.046	1.078	1.075	1.086	0.000	7.284	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification													
This Project establishes, validates or modifies explosives technical safety requirements per Department of Defense Pamphlet 385-64, Ammunition and Explosives Safety Standards. Project activities promote Research, Development, Test, & Evaluation (RDTE) of new and innovative explosives safety technologies that improve the survivability of Army personnel, facilities, and equipment as well as improve the health, safety and welfare of the general public. FY 2021 funding will support continued testing, validation, and regulatory integration for permanent, temporary and mobile ammunition & explosives (A&E) facilities as well as operations. The Defense Ammunition Center/US Army Technical Center for Explosives Safety (DAC/USATCES) will team with and sponsor agencies (Joint Service, Academia, and Contractor) to improve the effectiveness of identifying, analyzing, and apply risk acceptance to ammunition and explosive environments.													
B. Accomplishments/Planned Programs (\$ in Millions)													
Title: Risk based explosives safety criteria													
Description: Development of risk based explosives safety criteria that will aid commanders and safety personnel in the transition from regulation to risk management.													
FY 2020 Plans: Will continue explosives testing and support of hazard research and exposure consequences.													
FY 2021 Plans: Will continue explosives testing and support of hazard research and exposure consequences.													
FY 2020 to FY 2021 Increase/Decrease Statement: Funding numbers are the same as FY2020.													
Title: Development of enhanced protective structure designs													
Description: Develop enhanced protective structure designs that improve the survivability of Army personnel, facilities and equipment.													
FY 2020 Plans: Will continue explosives testing and support for improving protective construction designs.													
FY 2021 Plans:													

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / Munitions Standardization, Effectiveness and Safety	Project (Number/Name) 858 / Army Explosives Safety Management Program	
B. Accomplishments/Planned Programs (\$ in Millions) Will continue explosives testing and support for improving protective construction designs.		FY 2019	FY 2020
FY 2020 to FY 2021 Increase/Decrease Statement: Funding increase due to within-Project re-prioritization and adjustment for inflation.			
Title: Development of explosive safety tools Description: Develop explosive safety tools for use by Army personnel. Explosive safety tools allow commanders and safety personnel to make explosive safety decisions using risk management methodologies.		0.300	0.235
FY 2020 Plans: Will continue development of new methods and tools for risk assessment to improve explosive safety risk management decisions.			0.250
FY 2021 Plans: Will continue development of new methods and tools for risk assessment to improve explosive safety risk management decisions.			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding numbers are the same as FY2020.			
Title: FY 2020 SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC 638		-	0.046
FY 2020 Plans: Funding transferred in accordance with Title 15 USC 638			-
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638			
Accomplishments/Planned Programs Subtotals			0.959
C. Other Program Funding Summary (\$ in Millions)			1.011
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605805A / Munitions Standardization, Effectiveness and Safety				Project (Number/Name) 859 / Life Cycle Pilot Process				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
859: Life Cycle Pilot Process	-	31.235	10.600	5.695	-	5.695	5.795	5.895	5.894	5.920	0.000	71.034	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification													
To execute the Single Manager for Conventional Ammunition (SMCA) Industrial Base Strategic Plan, this project supports: material and manufacturing technology investigations and assessments; pilot prototype processes; technology and process assessment for industrial base safety, security and environmental concerns; mitigate supply chain risks by assessing alternative processes and materials for Army's legacy products. Projects support overall research, development and modernization efforts towards rapid technological advancements and the changing character of war. Specifically, this project assesses life cycle production capabilities required for all ammunition families; address design for manufacturability to facilitate economical production; identify industrial and technology requirements; address production base concerns that may impact availability for cost effective quality products and assess security capability gaps to ensure a robust manufacturing supply chain processes. In addition, the Life Cycle Pilot Process (LCPP) program addresses Single Point Failures (SPFs) and no source of supply within the National Technology Industrial Base (NTIB). LCPP provides support to reduce supply chain risk by investigating, developing and evaluating additional sources of supply for a known SPF. (LCPP) provides the resources to prototype critical technologies, improve security processes and requirements; develop a knowledge base to establish cost effective, environmentally safe and modern production processes in support of transforming the Industrial Base.													
FY 2021 funding will support various efforts to reduce manufacturing and production costs; bridge technology transition between research and production; and assess security vulnerabilities within the NTIB. Program will continue to investigate and evaluate manufacturing technology; assess improved security processes; alternative materials and processes to address supply chain risks and resiliency concerns.													
B. Accomplishments/Planned Programs (\$ in Millions)											FY 2019	FY 2020	FY 2021
Title: Product Cost Thrust Area											1.261	2.033	0.814
Description: This thrust area seeks out new opportunities to reduce overall cost of armaments and ammunition components. Efforts will review and analyze legacy manufacturing processing for opportunities to integrate improved technology and materials to lean manufacturing processes to reduce overall unit cost.													
FY 2020 Plans: Continue to evaluate new materials, processes and technology to reduce overall production and end item costs for the Army. Complete and transfer Insensitive Munition Explosive (IMX) riser reclamation project to Iowa Army Ammunition Plant. Complete ultrasonic inspection of slurry coated explosives effort. Effort seeks to monitor critical parameters of explosive manufacturing and increase production yield and reduce rework costs.													
FY 2021 Plans:													

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / Munitions Standardization, Effectiveness and Safety	Project (Number/Name) 859 / Life Cycle Pilot Process			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019	FY 2020	FY 2021
Continue to evaluate and investigate mature manufacturing process and technologies. Assess alternative materials to reduce end item and production costs for transition to the Army's Industrial Base. Efforts include but not limited to: configuration analysis to reduce amount of energetics to affect overall legacy end items grenade costs; assess alternative materials for fielded propulsion end items to cost avoid potential shutdowns and failure analyses, assess in-line process inspection technology to reduce producibility costs an increase product yields for GOCO facilities.					
FY 2020 to FY 2021 Increase/Decrease Statement: Decrease due to reduction of Product Cost thrust area requirements.					
Title: Single Point Failures (SPFs)			1.925	1.320	1.470
Description: This thrust area seeks to mitigate single source and no source of supply to armaments and ammunition manufacturing operations. Thrust area tests or evaluates alternative materials and processes to mitigate SPFs. These efforts are part of the overall strategy to reduce the number of SPFs in the NTIB. Additionally, thrust area efforts will address ammunition manufacturing capability shortfalls. This area leverages RDTE accomplishments and product knowledge to satisfy manufacturing requirements.					
FY 2020 Plans: Continue to mitigate single source and/or no source of supply for armaments and ammunition manufacturing operations. Transition mitigation plan to Program Manager for their use in risk mitigation implementation supply strategies and assessing procurement strategies for affected end items. Continue BDNPA/F nitro plasticizer Single Point of Failure mitigation. Complete liquid reserve Single Point of Failure and alternative anti-seize materials for artillery efforts.					
FY 2021 Plans: Continue to assess technology and material alternatives to mitigate single source and no source of supply for in production end items and end item components. Efforts include but not limited to: scale-up and optimizing manufacturing process for an energetic constituent to mitigate no source of supply risk, evaluate lubricant alternatives for artillery end items to mitigate no source of supply risk. Investigative findings will be transition to product PM via engineering change proposal to existing Technical Data Package (TDP) or include into procurement strategies for affected end items.					
FY 2020 to FY 2021 Increase/Decrease Statement: Increase in program priorities to reduce or mitigate SPF within the Army's OCONUS supply chain risk.			2.049	1.993	3.411
Title: Manufacturing Technology for Industrial Base Transformation					
Description: This thrust area matures ammunition manufacturing technologies, processes to enhance manufacturing, security capabilities of legacy armaments and ammunition manufacturing operations. Thrust area will pilot and transition processes to affected industrial base for armaments and ammunition manufacturing operations.					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / Munitions Standardization, Effectiveness and Safety	Project (Number/Name) 859 / Life Cycle Pilot Process		
B. Accomplishments/Planned Programs (\$ in Millions)				
		FY 2019	FY 2020	FY 2021
FY 2020 Plans: Continue manufacturing technology assessments / investigations and develop technology transfer strategies for implementation to Army's industrial base. Complete ultrasonic inspection of slurry coated explosives effort. Effort seeks to monitor critical parameters of explosive manufacturing and increase production yield and reduce rework costs. Complete pre-cursor celluloid for foamed celluloid applications to mitigate OCONUS celluloid source. Effort will develop improved method to support foam celluloid applications.				
FY 2021 Plans: Continue investigation and pilot mature manufacturing technologies and processes towards transforming the Army's Industrial Base. Efforts include but not limited to: assessment of reuse and recycle technology for industrial waste applications (insensitive munition waste constituent recovery and RDX waste stream mitigation), pilot manufacturing technology to improve aging manufacturing process methods and improve manufacturing efficiencies.				
FY 2020 to FY 2021 Increase/Decrease Statement: Increase in program priorities to enhance capabilities of aging legacy manufacturing and reduce cost of waste treatment and disposal.				
Title: FY 2020 SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC 638		-	0.254	-
FY 2020 Plans: Funding transferred in accordance with Title 15 USC 638 FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638				
Accomplishments/Planned Programs Subtotals			5.235	5.600
Congressional Add: Congressional Add FY 2019 Accomplishments: Congressional Add FY 2020 Plans: Congressional Add			FY 2019	FY 2020
			26.000	5.000
			Congressional Adds Subtotals	26.000
				5.000

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / <i>Munitions Standardization, Effectiveness and Safety</i>	Project (Number/Name) 859 / <i>Life Cycle Pilot Process</i>
C. Other Program Funding Summary (\$ in Millions)		
N/A		
Remarks		
D. Acquisition Strategy		
N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605805A / Munitions Standardization, Effectiveness and Safety				Project (Number/Name) F21 / NATO Ammo Evaluation				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
F21: NATO Ammo Evaluation	-	0.650	0.750	0.749	-	0.749	0.749	0.749	0.749	0.749	0.000	5.145	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification													
North Atlantic Treaty Organization (NATO) Ammunition Evaluation program funding ensures interchangeability of ammunition and weapons among all the NATO countries with all of the associated logistic, strategic and tactical advantages of the alliance. This Project involves development and testing compliance of NATO standardization agreements (STANAGS) and staffing of the North American Regional Test Center (NARTC). In addition, this Project supports small caliber ammunition, 50mm ammunition, 40mm grenade munitions, medium caliber cannon ammunition, and large caliber ammunition enhancements to lethality, effectiveness, survivability, accuracy, and general product improvements. This Project also supports the standardization and interchangeability of legacy and new production U.S. weapons and ammunition with Allied Nations to maximize battlefield interchangeability/ compatibility under the auspices of international agreements to include NATO working groups, the Joint Ballistics Memorandum of Understanding (JBMOU), and information/ data exchange agreements. Maximizing standardization, interchangeability, and exportability will also potentially increase Foreign Military Sales (FMS) of U.S. indirect fire weapon and munition products to support United States industrial base production and affordable Department of Defense pricing through increased economies of scale. FY 2021 funding will support NATO and JBMOU artillery and small arms ammunition interchangeability group meetings, documentation, and test operations.													
B. Accomplishments/Planned Programs (\$ in Millions)											FY 2019	FY 2020	FY 2021
Title: New Ammo Design Qualification & NATO Mission Support											0.145	0.283	0.300
Description: This activity ensures complete interchangeability of small caliber, automated cannon-caliber, 40mm grenade ammunition, air burst capable 30mm/40mm ammunition, 50mm ammunition, large caliber ammunition and weapons among NATO countries to achieve the associated logistic, strategic and tactical advantages.													
FY 2020 Plans: Will continue work to support NATO small arms ammunition, direct fire grenade, and large caliber interchangeability group meetings, documentation and test operations.													
FY 2021 Plans: Will continue work to support NATO small arms ammunition, direct fire grenade, and large caliber interchangeability group meetings, documentation and test operations.													
FY 2020 to FY 2021 Increase/Decrease Statement: Funding change reflects planned lifecycle of this effort.													
Title: Joint Ballistics Program Support											0.505	0.433	0.449

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / Munitions Standardization, Effectiveness and Safety	Project (Number/Name) F21 / NATO Ammo Evaluation			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019	FY 2020	FY 2021
Description: The activity supports the maturation, validation, and risk reduction of battlefield interchangeability/ compatibility and associated enabling technologies between domestic U.S. and the North Atlantic Treaty Organization (NATO)/ Allied Nations indirect fires weapons and munitions.					
FY 2020 Plans: FY 2020 will continue interoperability testing and interchangeability group meetings.					
FY 2021 Plans: FY 2021 will continue interoperability testing and interchangeability group meetings.					
FY 2020 to FY 2021 Increase/Decrease Statement: FY 2021 decrease to Joint Ballistics Program support.					
Title: FY 2020 SBIR/STTR Transfer			-	0.034	-
Description: Funding transferred in accordance with Title 15 USC 638					
FY 2020 Plans: Funding transferred in accordance with Title 15 USC 638					
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638					
Accomplishments/Planned Programs Subtotals			0.650	0.750	0.749
C. Other Program Funding Summary (\$ in Millions)					
N/A					
Remarks					
D. Acquisition Strategy					
N/A					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)			
2040 / 6					PE 0605805A / Munitions Standardization, Effectiveness and Safety				F24 / Conventional Munitions Demil			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
F24: Conventional Munitions Demil	-	16.026	24.644	16.314	-	16.314	16.882	16.680	17.471	17.648	0.000	125.665
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	

A. Mission Description and Budget Item Justification

The Conventional Munitions Demilitarization Technology Project supports the Single Manager for Conventional Ammunition (SMCA) responsibility per Department of Defense Instruction (DoDI) 5160.68 to plan, program, budget and fund a Joint Service research and development program that develops capability and capacity as well as technology and facilities to support the SMCA mission to demilitarize and dispose of conventional ammunition stored in the SMCA Resource, Recovery and Disposition Account (B5A). Project goals include SMCA efforts to increase efficiencies and effectiveness to reduce the demil stockpile; reduce processing costs including packaging, handling and crating; and increase capacity through improved demil capabilities and processes. Project F24 includes several activities: (1) to establish requirements and develop processes to focus investments, assess capabilities, analyze alternatives, and recommend and implement RDT&E projects; (2) to improve products and processes that support existing capabilities; (3) to develop or improve demil methods and processes related to advance the primary demilitarization core thrust areas of destruction, disassembly, removal, resource recovery and recycling, and waste stream treatment; (4) to ensure safe and environmentally acceptable demil operations; (5) to transition RDT&E products to United States Army depots or plants as well as commercial facilities performing demil; and (6) to mitigate risk and close-out Project activities.

During Fiscal Year (FY) 2021 Project F24 will focus efforts on fielding alternative capabilities to open burn and open detonation. In FY21 Project F24 will also conduct conventional ammunition demilitarization operational testing on a Castalia system.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Title: Advanced Destruction	4.001	4.084	4.039
Description: This effort focuses on developing capabilities and capacities for the destruction of munitions.			
FY 2020 Plans: Will conduct operational testing of a static detonation chamber. Will conduct conventional ammunition operational testing on a Castalia System. Will conduct an operational test at MCAAP for Engine Starter Cartridges. Will conduct a static fire test of Nike Herc Missiles. Will conduct a safety and condition assessment on additional obsolete rocket motors			
FY 2021 Plans: Conduct an operational test of a reactive armor tile demil oven. Conduct operational testing of a capability to demil plastic walled shotgun cartridges. Initiate a design for a capability to demilitarize Honest John Warheads.			
FY 2020 to FY 2021 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 6	PE 0605805A / Munitions Standardization, Effectiveness and Safety	F24 / Conventional Munitions Demil	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020
Decrease from FY 2020 to FY 2021 resulting from McAlester Cryofracture Demilitarization Facility (MCDF) transition occurring in FY 2020 and addressing new requirements in FY 2021.			
Title: Resource Recovery and Recycling (R3) Description: This effort focuses on enhancing existing methods of munitions R3. FY 2020 Plans: Will initiate fabrication of components for Automated Scrap Inspection System. Will conduct an operational test on Red Phosphorus (RP) Mortar Demil Capability at Crane Army Ammunition Activity (CAAA). FY 2021 Plans: Conduct an operational test for Automated Scrap Inspection System comparing visual inspection to machine based inspection. FY 2020 to FY 2021 Increase/Decrease Statement: Increase from FY 2020 to FY 2021 resulting addressing prove-out of Automated Scrap Inspection in FY 2021.		2.212	2.530
Title: Advanced Removal Description: This effort develops technology to remove propellant and energetics from munitions. FY 2020 Plans: Will transition an initial operational capability (IOC) for Infrared (IR) munitions at Crane Army Ammunition Activity (CAAA). Will transition an IOC for 2.75" Rockets at CAAA. Will initiate an Analysis of Alternative (AoA) for Insensitive Munitions (IM) Large Bombs. Will conduct an AoA for IM Autoclave Upgrades. FY 2021 Plans: Complete installation of Shaped Charge Removal equipment to allow thermal treatment. Fabricate components for the capability to demil 155mm Illumination Projectiles. Complete transition of 2.75" Rocket Motor Capability. FY 2020 to FY 2021 Increase/Decrease Statement: Decrease from FY 2020 to FY 2021 resulting from 2.75" Rocket Static Fire Capability occurring in FY 2020 and addressing new requirements in FY 2021.		2.505	2.887
Title: Advanced Waste Stream Treatment Description: This effort focuses on handling waste streams from munitions items. FY 2020 Plans:		3.241	3.533

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / Munitions Standardization, Effectiveness and Safety	Project (Number/Name) F24 / Conventional Munitions Demil	
B. Accomplishments/Planned Programs (\$ in Millions)			
Will initiate installation of upgraded feed system at an organic installation. Will initiate a project to upgrade a RKI for CS gas treatment. Will initiate a design for a Bulk Energetic Confined Burn System at an organic location.		FY 2019	FY 2020
FY 2021 Plans: Initiate installation of the APE 1236 Feed System Upgrade at TEAD. Complete Bangbox emissions testing of munitions to determine additional emission factors for stockpile munitions. Conduct analysis of pyrotechnic munitions.			
FY 2020 to FY 2021 Increase/Decrease Statement: Decrease from FY20 to FY21 resulting from completing the Flare Simulator Demil capability and Feed Recipes Evaluation Efficiency transition occurring in FY20 and addressing new requirements in FY21.			
Title: Advanced Munitions Disassembly Description: This effort focuses on developing innovative and efficient processes to disassemble munitions.	4.067	5.867	5.143
FY 2020 Plans: Will continue systemization of a Family of Scatterable Mines (FASCAM) demil project to integrate the preprocessing Cryofracture capability of FASCAM mines with thermal processing in the rotary kiln at Crane Army Ammunition Activity (CAAA). Conduct an operational demonstration on 155mm APICM projectile download capability at HWAD.			
FY 2021 Plans: Complete Transition of a Reactive Armor Tile Size Reduction Capability. Install and test a delinking and sorting capability for small arms cartridges to be fed into the APE 1236 RKI. Conduct the Final design review of Smoke Hand Grenade Demil Capability.			
FY 2020 to FY 2021 Increase/Decrease Statement: Decrease from FY20 to FY21 resulting from MK46 Torpedo Capability and Reactive Armor Tile Thermal Treatment operational testing occurring in FY20 and addressing new requirements in FY21.			
Title: FY20 Congressional FY 2020 Plans: Misalignment of Congressional funds. Will be realigned to the 859 program.	-	4.851	-
FY 2020 to FY 2021 Increase/Decrease Statement: The FY20 Congressional mark was erroneously placed on F24. The \$5M should be on project 859.			
Title: FY 2020 SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC 638	-	0.892	-

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605805A / Munitions Standardization, Effectiveness and Safety	Project (Number/Name) F24 / Conventional Munitions Demil	
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019 FY 2020 FY 2021
FY 2020 Plans: Funding transferred in accordance with Title 15 USC 638			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 638			
Accomplishments/Planned Programs Subtotals			16.026 24.644 16.314
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0605857A / Environmental Quality Technology Mgmt Support							
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	3.138	4.681	1.780	-	1.780	1.812	1.868	1.715	1.552	0.000	16.546
031: Environmentally Sustainable Acquisition/Logistics	-	2.217	4.119	1.336	-	1.336	1.362	1.388	1.417	1.422	0.000	13.261
061: Environmental Quality Technology Support	-	0.921	0.562	0.444	-	0.444	0.450	0.480	0.298	0.130	0.000	3.285

A. Mission Description and Budget Item Justification

This Program Element (PE) funds environmental quality technology (EQT)-related management support functions including support of research, development, test and evaluation required for EQT technical integration efforts at demonstration/validation test sites, technical information and activities, test facilities and general test instrumentation, and EQT requirement assessments. Funds support the management of technology transfer associated with technology demonstrated and validated as part of Army EQT projects. In addition, this PE provides support to the Army weapon system acquisition community to address environmental quality requirements under the Environmentally Sustainable Acquisition/Logistics Program.

The Environmentally Sustainable Acquisition/Logistics Project includes program management for developing acquisition strategies that achieve system key performance parameters and sustain the environment without permanent and unacceptable change to the natural environment or human health from system concept refinement through disposal. The Project involves systematic consideration of environmental impacts, energy use, natural resources, installation impacts, economics, and quality of life. It provides support to the system acquisition community (Program and Project Managers) to integrate environmental quality analyses into the system acquisition process. The goal of the effort is to resolve environmental quality issues related to weapon systems that are identified during design, development, testing, operation, or support to reduce Army environmental liabilities and total ownership costs, including efforts to eliminate the use of hazardous and ozone-depleting materials from weapon systems and facilities.

The Pollution Prevention Tech Support Project funds the management support costs to execute the Toxic Metals Reduction, Airborne Lead Reduction, and Low Global Warming Potential (LGWP) environmental quality technology programs, which support Cross Functional Teams and the Army's top modernization priorities by addressing potential obsolescence of legacy materials and current and emerging impacts on human health and the environment.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army					Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name) PE 0605857A / Environmental Quality Technology Mgmt Support				
B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	3.211	4.681	2.790	-	2.790
Current President's Budget	3.138	4.681	1.780	-	1.780
Total Adjustments	-0.073	0.000	-1.010	-	-1.010
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.073	-			
• Adjustments to Budget Years	-	-	-1.010	-	-1.010

Change Summary Explanation

FY2021 decrease of \$1.010M realigned to support higher Army priorities.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)			
2040 / 6					PE 0605857A / Environmental Quality Technology Mgmt Support				031 / Environmentally Sustainable Acquisition/Logistics			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
031: Environmentally Sustainable Acquisition/Logistics	-	2.217	4.119	1.336	-	1.336	1.362	1.388	1.417	1.422	0.000	13.261
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	

A. Mission Description and Budget Item Justification

The Environmentally Sustainable Acquisition/Logistics (ESAL) Project provides support to the system acquisition community to integrate environmental quality issues and concerns into the life cycle system acquisition process, including human health risks, life safety, material obsolescence due to regulatory pressures, occupational exposures and energy efficiency. This includes helping the acquisition community address high priority issues associated with hexavalent chromium, cadmium and airborne lead. The focus of ESAL is on improving readiness, enabling mission capabilities, improving acquisition processes, reducing supportability burden, and minimizing total ownership cost. The Assistant Secretary of the Army for Installations, Energy and Environment has defined the functions of the ESAL project in coordination with the Army Acquisition Executive and the Assistant Secretary of the Army (Acquisition, Logistics, and Technology). This Project provides direct support to the Army acquisition community to pursue environmental sustainability and comply with legal statutes, policies and regulations during the life cycle of Army materiel. ESAL helps address Army Modernization Priorities, while sustaining readiness and achieving compliance with its weapon systems, industrial base, field and deployed activities directed by international treaties, Federal statutes, Executive Orders, Department of Defense (DoD) and Army policies and regulations.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Title: Environmental Quality (EQ) Support (CCDC)	1.000	0.975	0.600
Description: Provide EQ Support to Acquisition Programs via Cross Functional Teams (CFTs), Program Executive Offices (PEOs) and Program Managers (PMs).			
FY 2020 Plans: Will provide support to PEOs / PMs and CFTs to integrate EQ considerations into systems engineering activities. This will include fulfillment of National Environmental Policy Act requirements, definition of EQ technology needs to meet operational requirements, analysis of technical data to support implementation decisions, participation in technical and cost risk assessment activities, and assessment and revision of contractual and operational requirements for successful technology integration, operation and support. Will analyze impending legal statutes impacting production, operation and support of weapon systems. Will assess weapon system readiness impacts (e.g., production levels, training, operational tempo and maintenance activities) resulting from EQ issues affecting industrial base and garrisons. Will provide Army acquisition community representation in select OSD and DA committees addressing environmental legislation and rulemaking.			
FY 2021 Plans: Will provide support to CFTs, PEOs and PMs to integrate EQ considerations into systems engineering activities. This will include fulfillment of National Environmental Policy Act requirements, definition of EQ technology needs to meet operational requirements,			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 6	PE 0605857A / Environmental Quality Technology Mgmt Support	031 / Environmentally Sustainable Acquisition/Logistics	
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
analysis of technical data to support implementation decisions, participation in technical and cost risk assessment activities, and assessment and revision of contractual and operational requirements for successful technology integration, operation and support. Will analyze impending statutes and regulations impacting production, operation and support of weapon systems. Will assess weapon system readiness impacts (e.g., production levels, training, operational tempo and maintenance activities) resulting from EQ issues affecting industrial base and garrisons. Will provide Army acquisition community representation in select Office of the Secretary of Defense and Department of the Army committees addressing environmental legislation and rulemaking.			
FY 2020 to FY 2021 Increase/Decrease Statement:			
Funding realigned to higher modernization priorities.			
Title: Environmental Quality Technology Management (CCDC)	1.215	1.107	0.736
Description: Provide management support for Army EQ technology efforts.			
FY 2020 Plans:			
Will provide system acquisition support to the Army's EQ technology program and coordination of EQ-related systems' needs for expanded RDTE efforts in support of Army Modernization Priorities. Will manage and oversee technology integration efforts by Army Life Cycle Management Commands for weapon systems in all stages of design, procurement and operations/support. Will coordinate RDTE requirements among members of the Army EQ Technology Teams and Cross Functional Teams, will coordinate technology evaluations and operational requirements in support of weapon system platform integration, will manage and oversee test plan development, will oversee testing activities, and will analyze test results to support weapon systems engineering decision making.			
FY 2021 Plans:			
Will provide system acquisition support to the Army's EQ technology program and coordination of EQ-related system needs for expanded Research, Development, Test and Evaluation efforts in support of Army Modernization Priorities. Will manage and oversee technology integration efforts by Army Life Cycle Management Commands for weapon systems in all stages of design, procurement and operations/support. Will coordinate technology requirements among members of the Army EQ Technology Teams and Cross Functional Teams, will coordinate technology evaluations and operational requirements in support of weapon system platform integration, will manage and oversee test plan development, will oversee testing activities, and will analyze test results to support weapon systems engineering decision making.			
FY 2020 to FY 2021 Increase/Decrease Statement:			
Funding realigned to higher modernization priorities.			
Title: Headquarters Army Environmental System (HQAES)	-	1.947	-

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605857A / Environmental Quality Technology Mgmt Support	Project (Number/Name) 031 / Environmentally Sustainable Acquisition/Logistics		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
<p>Description: Headquarters Army Environmental System support (HQAES) is the Army's environmental enterprise business system of record enabling the Army to collect, analyze, and report environmental data. HQAES is used by Installations, Commands, Headquarters Department of the Army, and various service providers (e.g., U.S Army Corps of Engineers, U.S. Army Environmental Command) for managing the environmental program. HQAES is the feeder system for environmental liabilities reporting, which is the largest liability on the Army's financial statement. HQAES has the capability to track environmental project execution and end-to-end program management and provides visibility and transparency needed for cost and functional environmental management, including cleanup, compliance and conservation at active Army, Army National Guard; Army Reserve and Base Realignment and Closure (BRAC) installations.</p> <p>FY 2020 Plans: In FY20 the HQAES PMO will continue execution of capability enhancements to improve usability, enhance decision support, and improve the integrity and available of actionable data. This will include the following to include those identified during the roadmap/acquisition refinement:</p> <ul style="list-style-type: none">- Provide remote capabilities to perform Environmental Performance Assessment System audits, data analysis, and other processes required for critical business lines- Develop data interfaces been remote applications, data storage systems or front-end views and HQAES- Integrate solid waste management capabilities- Integrate data from authoritative Army and DoD sources (real property, financial, geospatial, global mail etc.)- Provide universal reporting formats for Army-wide use <p>FY 2020 to FY 2021 Increase/Decrease Statement: Funding realigned to higher modernization priority.</p> <p>Title: FY 2018 NDAA SEC 825 MDAP Cost Overrun</p> <p>Description: FY 2018 NDAA SEC 825 MDAP Cost Overrun</p> <p>Title: FY 2020 SBIR/STTR Transfer</p> <p>Description: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement:</p>				
				0.002 - -
				- 0.090 -

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605857A / Environmental Quality Technology Mgmt Support	Project (Number/Name) 031 / Environmentally Sustainable Acquisition/Logistics	
B. Accomplishments/Planned Programs (\$ in Millions) Funding transferred in accordance with Title 15 USC ?638		FY 2019	FY 2020
		Accomplishments/Planned Programs Subtotals	2.217
			4.119
			1.336
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
TBD			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)			
2040 / 6					PE 0605857A / Environmental Quality Technology Mgmt Support				06I / Environmental Quality Technology Support			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
06I: Environmental Quality Technology Support	-	0.921	0.562	0.444	-	0.444	0.450	0.480	0.298	0.130	0.000	3.285
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	

A. Mission Description and Budget Item Justification

This Project provides Research, Development, Test, & Evaluation (RDTE) Management Support for the demonstration and validation of innovative technologies to modernize materials and processes required for current and future operational sustainment and warfighter training capabilities within the Army's Environmental Quality Technology program. The Project supports technologies that increase life safety, reduce Soldier and worker human health risks, enhance readiness and enable mission capabilities of the current and future force, while simultaneously increasing performance and standardization across the Army. This Project provides for management of RDTE activities conducted under project 0603779A (Environmental Quality Technology Dem/Val) / Project E21 (Environmental Quality Technology Dem/Val), which supports the Cross Functional Teams and the Army's top modernization priorities by addressing potential obsolescence of legacy materials and current and emerging impacts on human health and the environment. The Project expedites technology transition from the laboratory to operational use by establishing toxicology assessments to support the demonstration of modern materials and processes fulfilling or surpassing the performance requirements outlined in Material Specifications, Depot Maintenance Work Requirements, Technical Manuals, Drawings, and other technical data.

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

	FY 2019	FY 2020	FY 2021
Title: Management of Army Environmental Quality Technology Programs (CCDC)	0.439	0.537	0.444
Description: Manage and oversee the demonstration/validation of weapon system pollution prevention technologies within the Army's Environmental Quality Technology Program with a focus on eliminating the high priority issues associated with hexavalent chromium, cadmium and airborne lead through material substitution.			
FY 2020 Plans: Will manage and oversee the demonstration/validation of three technology efforts that support the Future Vertical Lift, Next Generation Combat Vehicle, Long Range Precision Fire and Soldier Lethality Army modernization priorities: Toxic Metal Reduction in Surface Finishing of Army Weapon Systems; Airborne Lead Reduction from Army Weapon Systems; and Low Global Warming Potential Alternatives to Ozone Depleting Substances.			
FY 2021 Plans: Will manage and oversee the demonstration/validation of three technology efforts that support the Future Vertical Lift, Next Generation Combat Vehicle, Long Range Precision Fire and Soldier Lethality Army modernization priorities: Toxic Metal Reduction in Surface Finishing of Army Weapon Systems; Airborne Lead Reduction from Army Weapon Systems; and Low Global Warming Potential Alternatives to Ozone Depleting Substances.			
FY 2020 to FY 2021 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 6	PE 0605857A / Environmental Quality Technology Mgmt Support	061 / Environmental Quality Technology Support	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020
Funding realigned to higher modernization priorities.			
Title: Environmental, Safety and Occupational Health Impacts of Short-Term Noise Assessment Procedures	0.247	-	-
Description: Manage and oversee the demonstration and validation of technologies for making Army blast noise short-term noise assessment.			
Title: Advanced Water Reuse Technology for Fixed Installations	0.235	-	-
Description: Advanced water reuse technologies demonstration and guidance for Army fixed installations applications.			
Title: FY 2020 SBIR/STTR Transfer	-	0.025	-
Description: Funding transferred in accordance with Title 15 USC ?638			
FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals			0.921
C. Other Program Funding Summary (\$ in Millions)			0.562
N/A			0.444
<u>Remarks</u>			
<u>D. Acquisition Strategy</u>			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0605898A / Army Direct Report Headquarters - R&D - MHA							
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	53.526	53.820	55.045	-	55.045	55.785	56.309	58.408	59.424	0.000	392.317
FJ2: Army SHARP RDTE	-	1.530	1.600	1.599	-	1.599	1.599	1.599	1.599	1.599	0.000	11.125
M65: Army Test and Evaluation Command	-	48.058	48.264	49.429	-	49.429	50.078	50.564	52.616	53.632	0.000	352.641
XW7: Command HQ - ARI	-	3.938	3.956	4.017	-	4.017	4.108	4.146	4.193	4.193	0.000	28.551

A. Mission Description and Budget Item Justification

This Program Element (PE) provides funding for the salaries and related personnel benefits for authorized civilian personnel positions that provide for the management functions and the technical direction of the United States (U.S.) Army Test and Evaluation Command (ATEC) mission located at Aberdeen Proving Ground (APG), Maryland (Project M65 Army Test and Evaluation Command). It also provides funds supporting similar functions at the United States (U.S.) Army Research Institute for the Behavioral and Social Sciences (Project XW7 Command HQ - ARI), and provides funds for Army Headquarters to study and improve the Sexual Harassment / Assault Response and Prevention program (Project FJ2 Army SHARP RDTE).

ATEC plans, conducts and integrates developmental testing, independent operational testing, independent evaluations, and assessments to provide essential information to Soldiers and acquisition decision makers supporting the American Warfighter. Additionally, ATEC is a Direct Support to Army Futures Command (AFC). ATEC provides testing and independent evaluation support to AFC Cross Functional Team (CFT) efforts including risk reduction support to experiments, demonstrations, requirements, research, development, and acquisition. As such, ATEC priorities are aligned to the Army's Modernization priorities.

Project M65 includes staff/management functions of resource management, human resources, safety, security, environmental, strategic planning and information/technology support for command-wide databases in support of the developmental, evaluation and operational test mission with technical direction to the Army Evaluation Center (AEC), APG, Maryland; to the Operational Test Command (OTC), Fort Hood, Texas which consists of three forward Test Directorates (Airborne and Special Operations Test Directorate, Fort Bragg, North Carolina; Air Defense Artillery Test Directorate, Fort Bliss, Texas; and the Fires Test Directorate, Fort Sill, Oklahoma) together with four other Test Directorates (Aviation; Maneuver; Mission Command; Maneuver Support and Sustainment) at Ft Hood, Texas; and to the seven Major Range and Test Facility Base (MRTFBs) and one non-MRTFB test range: Aberdeen Test Center (ATC) at APG, Maryland; West Desert Test Center (WDTC) at Dugway Proving Ground (DPG), Utah; Electronic Proving Ground (EPG) at Fort Huachuca, Arizona; White Sands Test Center (WSTC) at White Sands Missile Range (WSMR), New Mexico; Yuma Test Center (YTC) at Yuma Proving Ground (YPG), Arizona; Cold Regions Test Center (CRTC) at Fort Greely, Alaska; and Tropic Regions Test Center (TRTC) at various locations, as well as for Redstone Test Center (RTC) at Redstone Arsenal, Alabama. This is the operating budget for ATEC Headquarters, which provides technical direction for the annual execution of approximately 2,300 developmental tests; approximately 53 operational events; and approximately 900 Evaluation and Safety documents supporting acquisition programs. ATEC's total authorized workforce amounts to a \$1.7 billion program in direct and reimbursable funding.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army		Date: February 2020												
Appropriation/Budget Activity	R-1 Program Element (Number/Name)													
2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	PE 0605898A / Army Direct Report Headquarters - R&D - MHA													
Project XW7 provides the non-Army Management Headquarters Activity (non-AMHA) management and administrative support that enables the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) to accomplish its research mission and includes personnel/manpower execution and oversight. ARI's behavioral and social science research provides effective non-materiel solutions to help the Army adjust to changes in force size and structure, a variety of mission demands and contexts, challenges in human relations, and budgetary constraints. ARI is the only Science and Technology (S&T) laboratory that conducts research to enhance the Soldier lifecycle (e.g., selection, assignment, training, and leader development).														
Project FJ2 provides Army Management Headquarters a critical research capability to improve the Army Sexual Harassment / Assault Response and Prevention (SHARP) program, with a specific focus on prevention.														
This PE does not finance test facility operations, test instrumentation, or test equipment.														
B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total									
Previous President's Budget	54.130	53.820	54.544	-	54.544									
Current President's Budget	53.526	53.820	55.045	-	55.045									
Total Adjustments	-0.604	0.000	0.501	-	0.501									
• Congressional General Reductions	-	-												
• Congressional Directed Reductions	-	-												
• Congressional Rescissions	-	-												
• Congressional Adds	-	-												
• Congressional Directed Transfers	-	-												
• Reprogrammings	-	-												
• SBIR/STTR Transfer	-0.604	-												
• Adjustments to Budget Years	-	-	0.501	-	0.501									

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605898A / Army Direct Report Headquarters - R&D - MHA				Project (Number/Name) FJ2 / Army SHARP RDTE			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
FJ2: Army SHARP RDTE	-	1.530	1.600	1.599	-	1.599	1.599	1.599	1.599	1.599	0.000	11.125
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds contracts that cover critical research needs of the Army Sexual Harassment / Assault Response and Prevention (SHARP) Office and the greater Army with a specific focus on prevention. In Fiscal Year (FY) 2020 this contract achieves three goals: (1) to inform sexual harassment prevention research efforts (e.g., Consortium Research Fellows Program), (2) examine the nature of offending within the military to inform effective sexual assault prevention efforts, and (3) assess the efficacy of training/prevention/outreach efforts related to sexual assault, in particular but not limited to male service members. Ongoing efforts to meet the first goal will explore the nature of sexual harassment in the Army, identify the organizational costs related to harassment (e.g., increased turnover, lower job satisfaction, and job performance), and examine the role of sexual harassment as it relates to sexual assault within the continuum of harm. Based on these studies, the performer will recommend effective sexual harassment prevention strategies. Studies will ensure that Army SHARP programs build climates for dignity and respect free of sexual harassment. Some of these efforts may be achieved through a collaboration with the Consortium Research Fellows Program.

To meet the second goal, studies will examine behavioral patterns in offending within military sexual assault cases. For instance, behavioral patterns may reveal the nature of military sexual assault or identify potential vulnerabilities that could lead someone to perpetrate sexual assault. Studies may also be informed by offender patterns observed in research using administrative data sources. Based on this research, the performer will identify ways to reduce risk of sexual offending behavior, recommend ways to improve skills and abilities that will bolster one's ability to engage in healthy relationships, and inform effective sexual assault prevention practices.

To meet the third goal, research will (1) conduct male-specific assessments and (2) conduct other assessments that will assess the efficacy of training/prevention/outreach efforts related to sexual assault. The research will characterize the behaviors associated with military men's victimization and how they differ from those of service women, men's decision processes to file a formal report of sexual assault, and their experiences with the military sexual assault response systems. In particular, the research will focus on male victimization that occurred during military service rather than childhood sexual assault. Based on this research, the performer will identify ways to improve tailored recommendations for responding to and supporting male victims. This research will improve DoD prevention and response for male Service members. To meet the second part of this goal, the research may conduct assessments to evaluate the efficacy of training/prevention/outreach efforts related to sexual assault. This may involve conducting evaluation research to assess the effectiveness of individual programs or practices. Based on this research, the performer will determine whether these programs are effective and propose ways to improve SHARP efforts. This research will ensure that SHARP programs deliver effective training/prevention/outreach.

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

Title: Role Identifications	FY 2019	FY 2020	FY 2021
Description: Funding is required to ensure that Army SHARP is in compliance with multiple Service or DoD requirements. NDAA Requirement S585 (FY 2012) requires the development of SAPR curriculum for Service members and civilian employees,	1.530	1.527	1.599

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605898A / Army Direct Report Headquarters - R&D - MHA	Project (Number/Name) FJ2 / Army SHARP RDTE			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019	FY 2020	FY 2021
NDAA Requirement 1725c (FY 2014) requires the identification of qualifications needed for Service and civilian personnel who are assigned to positions that include SAPR functions, NDAA Requirement S1733 requires the review of SAPR training and recommendations for modification based on identified inadequacies, and NDAA Requirement S538 (FY 2016) dictates that the Services develop efforts to improve prevention and response for male victims of sexual assault. Conducting research to meet these requirements is a necessary step in ensuring that training, prevention and outreach activities are having the desired effect and impact on the Total Force.					
FY 2020 Plans: To meet the second goal, research will examine behavioral patterns in offending within military sexual assault cases. For instance, behavioral patterns may reveal the nature of military sexual assault or identify potential vulnerabilities that could lead someone to perpetrate sexual assault. The research may also be informed by offender patterns observed in research using administrative data sources. Based on this research, the performer will identify ways to reduce risk of sexual offending behavior, recommend ways to improve skills and abilities that will bolster one's ability to engage in healthy relationships, and inform effective sexual assault prevention practices.					
To meet the third goal, research will (1) conduct male-specific assessments and (2) conduct other assessments that will assess the efficacy of training/prevention/outreach efforts related to sexual assault. The research will characterize the behaviors associated with military men's victimization and how they differ from those of service women, men's decision processes to file a formal report of sexual assault, and their experiences with the military sexual assault response systems. In particular, the research will focus on male victimization that occurred during military service rather than childhood sexual assault. Based on this research, the performer will identify ways to improve tailored recommendations for responding to and supporting male victims. This research will improve DoD prevention and response for male Service members. To meet the second part of this goal, the research may conduct assessments to evaluate the efficacy of training/prevention/outreach efforts related to sexual assault. This may involve conducting evaluation research to assess the effectiveness of individual programs or practices. Based on this research, the performer will determine whether these programs are effective and propose ways to improve SHARP efforts. This research will ensure that SHARP programs deliver effective training/prevention/outreach.					
FY 2021 Plans: In FY2021, SHARP will continue research into all three goals. A key effort of 2021 in all three goals will be to take the results of 2020 efforts and begin more focused efforts on the areas and topics that appear to have the most promise in each area, looking at shorter-term and longer-term possibilities in each area. In Goal 1) Inform sexual harassment prevention efforts, the research may expand to examine other behaviors related to the sexual harassment-sexual assault continuum of harm to determine the relationships between other undesirable behaviors e.g. bullying and hazing, personal and personality characteristics to determine potential root and common causes and the etiology					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605898A / Army Direct Report Headquarters - R&D - MHA	Project (Number/Name) FJ2 / Army SHARP RDTE	
B. Accomplishments/Planned Programs (\$ in Millions)			
<p>of behavioral patterns, personal attributes and the cultural milieu and the interrelationships between individual perpetrators, individual victims and military culture that contribute as risk or protective factors.</p> <p>In Goal 2) Examine behavioral patterns in offending within military sexual assault cases, research results will be compared, contrasted and if relevant combined with the results of Goal 1 research to determine differences and commonalities along the continuum of harm and different means of addressing each and all.</p> <p>In Goal 3a) Male-specific assessments and determinants of male victimization the search for commonalities and differences in personal attributes and behavior will continue and the possibilities for prevention mechanisms explored.</p> <p>For each of the Goals and in general, assessments of current training and prevention efforts will continue and be informed by the results of the SAPRO-directed PPOA to be conducted in 2020. The results for each goal will be reviewed for potential for military and Army- feasible solutions to be developed in the prevention spectrum including but not limited to: universal education, awareness, messaging, social norms marketing, early identification and targeted education and prevention and remediation, accession marketing and policy and deterrent adjudication processes. 2021 research emphasis will be placed on a balance between potential short-term, high impact prevention efforts and longer term efforts that will require more fundamental research for full understanding or require shifts in military culture before the results can be fully exploited and realized.</p>	FY 2019	FY 2020	FY 2021
<p>FY 2020 to FY 2021 Increase/Decrease Statement: Funding for FY20 and FY21 are the same.</p> <p>Title: FY 2020 SBIR/STTR Transfer</p> <p>Description: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638</p>	-	0.073	-
Accomplishments/Planned Programs Subtotals	1.530	1.600	1.599
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
MDEP:VSHP does not have any other Army Line Item associated with this project.			
D. Acquisition Strategy			
N/A			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605898A / Army Direct Report Headquarters - R&D - MHA					Project (Number/Name) M65 / Army Test and Evaluation Command			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
M65: Army Test and Evaluation Command	-	48.058	48.264	49.429	-	49.429	50.078	50.564	52.616	53.632	0.000	352.641	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project provides funding for the salaries and related personnel benefits for the authorized civilian personnel positions that provide for the management functions and the technical direction of the United States (U.S.) Army Test and Evaluation Command (ATEC) mission located at Aberdeen Proving Ground (APG), Maryland. ATEC plans, conducts and integrates developmental testing, independent operational testing, independent evaluations, and assessments to provide essential information to Soldiers and acquisition decision makers supporting the American Warfighter. Additionally, ATEC is a Direct Support to the Army Futures Command (AFC). ATEC provides testing and independent evaluation support to AFC Cross Functional Team (CFT) efforts including risk reduction support to experiments, demonstrations, requirements, research, development, and acquisition. As such, ATEC priorities are aligned to the Army's Modernization priorities.

This Project includes staff/management functions of resource management, human resources, safety, security, environmental, strategic planning and information/technology support for command-wide databases in support of the developmental, evaluation and operational test mission with technical direction to the Army Evaluation Center (AEC), APG, Maryland; to the Operational Test Command (OTC), Fort Hood, Texas which consists of three forward Test Directorates (Airborne and Special Operations Test Directorate, Fort Bragg, North Carolina; Air Defense Artillery Test Directorate, Fort Bliss, Texas; and the Fires Test Directorate, Fort Sill, Oklahoma) together with four other Test Directorates (Aviation; Maneuver; Mission Command; Maneuver Support and Sustainment) at Ft Hood, Texas; and to the seven Major Range and Test Facility Base (MRTFBs) and one non-MRTFB test range: Aberdeen Test Center (ATC) at APG, Maryland; West Desert Test Center (WDTC) at Dugway Proving Ground (DPG), Utah; Electronic Proving Ground (EPG) at Fort Huachuca, Arizona; White Sands Test Center (WSTC) at White Sands Missile Range (WSMR), New Mexico; Yuma Test Center (YTC) at Yuma Proving Ground (YPG), Arizona; Cold Regions Test Center (CRTC) at Fort Greely, Alaska; and Tropic Regions Test Center (TRTC) at various locations, as well as for Redstone Test Center (RTC) at Redstone Arsenal, Alabama. This is the operating budget for ATEC Headquarters, which provides technical direction for the annual execution of approximately 2,300 developmental tests; approximately 53 operational events; and approximately 900 Evaluation and Safety documents supporting acquisition programs. ATEC's total authorized workforce amounts to a \$1.7 billion program in direct and reimbursable funding.

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

	FY 2019	FY 2020	FY 2021
Title: ATEC	48.042	47.789	49.429
Description: Civilian labor and other support required to manage and administer the Army test and evaluation mission at ATEC. ATEC plans, conducts and integrates developmental testing, independent operational testing, independent evaluations, assessments and experiments to provide essential information to Soldiers and acquisition decision makers supporting the American Warfighter.			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605898A / Army Direct Report Headquarters - R&D - MHA	Project (Number/Name) M65 / Army Test and Evaluation Command			
B. Accomplishments/Planned Programs (\$ in Millions)			FY 2019	FY 2020	FY 2021
FY 2020 Plans: Will fund authorized civilian salaries, associated expenses (supplies, equipment, travel, etc.) and other support required to manage and administer the Army test and evaluation mission at ATEC.					
FY 2021 Plans: Will continue to fund authorized civilian salaries, associated expenses (supplies, equipment, travel, etc.) and other support required to manage and administer the Army test and evaluation mission at ATEC.					
FY 2020 to FY 2021 Increase/Decrease Statement: Continuity of effort.					
Title: FY 2018 National Defense Authorization Act (NDAA) Section 825 Major Defense Acquisition Program (MDAP) Cost Overrun		0.016	-	-	-
Description: FY 2018 NDAA Section 825 MDAP Cost Overrun					
Title: FY 2020 SBIR/STTR Transfer		-	0.475	-	-
Description: Funding transferred in accordance with Title 15 USC ?638					
FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638					
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638					
Accomplishments/Planned Programs Subtotals			48.058	48.264	49.429
C. Other Program Funding Summary (\$ in Millions)					
N/A					
Remarks					
D. Acquisition Strategy					
N/A					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0605898A / Army Direct Report Headquarters - R&D - MHA				Project (Number/Name) XW7 / Command HQ - ARI			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
XW7: Command HQ - ARI	-	3.938	3.956	4.017	-	4.017	4.108	4.146	4.193	4.193	0.000	28.551
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The United States (U.S.) Army Research Institute for the Behavioral and Social Sciences (ARI) is the only Science and Technology (S&T) laboratory that conducts research to enhance the Soldier lifecycle (e.g., selection, assignment, training, leader development) and human relations (e.g., culture of dignity, respect, and inclusion). This Project supports the non-Army Management Headquarters Activity (non-AMHA) management and administrative functions to enable ARI to accomplish its research mission and includes activities such as budget execution, procurement oversight, Research, Development, Test, & Evaluation (RDTE) program planning and evaluation, management control, security/safety, logistics, information technology, and personnel/manpower execution and oversight. ARI's behavioral and social science research provides effective non-materiel solutions to help the Army adjust to changes in force size and structure, a variety of mission demands and contexts, challenges in human relations, and budgetary constraints.												
B. Accomplishments/Planned Programs (\$ in Millions)												
Title: Headquarters Support Description: This project supports Civilian Pay and support ARI headquarters activities. FY 2020 Plans: Providing personnel and support for management, administrative, personnel, budget, and information technology functions at a level consistent with Army and mission requirements to meet the needs of ARI as an Army Science and Technology Reinvention Laboratory (STRIL), to include emphasis on completing transition to the STRIL personnel development and performance management policies and practices.												
FY 2021 Plans: Will provide personnel and support for management, administrative, personnel, budget, and information technology functions at a level consistent with Army and mission requirements to meet the needs of ARI as an Army Science and Technology Reinvention Laboratory (STRIL), to include emphasis on evaluating ARI's implementation of the STRIL systems, policies, and practices.												
FY 2020 to FY 2021 Increase/Decrease Statement: Funding change reflects planned lifecycle of this effort.												
Title: FY 2020 SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC ?638 FY 2020 Plans:												

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0605898A / Army Direct Report Headquarters - R&D - MHA	Project (Number/Name) XW7 / Command HQ - ARI	
B. Accomplishments/Planned Programs (\$ in Millions) Funding transferred in accordance with Title 15 USC ?638		FY 2019	FY 2020
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638			FY 2021
		Accomplishments/Planned Programs Subtotals	3.938 3.956 4.017
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)								
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0606001A / Military Ground-Based CREW Technology								
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
Total Program Element	-	4.241	2.141	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.382	
FD4: Military Ground-Based CREW Technology	-	4.241	2.141	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.382	
Note													
In Fiscal Year 2021 (FY21) this Program Element is Eliminated.													
A. Mission Description and Budget Item Justification													
The Secretary of the Army was designated the Executive Agent for Military Ground-Based Counter Radio-Controlled Improvised Explosive Device (RCIED) Electronic Warfare (CREW) Technology on 1 December 2013, pursuant to Department of Defense (DoD) Directive 5101.14 "Military Ground-Based Military CREW Technology". The Program Executive Office for Intelligence, Electronic Warfare & Sensors (PEO IEW&S) is assigned the responsibility to fulfill the duties of the DoD Military Ground-Based CREW Technology Single Manager. The DoD Single Manager (SM) is responsible for ensuring joint operational interoperability and compatibility between relevant DoD and coalition systems; interfaces with all DoD Services and other government agencies involved in CREW Technologies; and collaborates with multiple foreign countries on the RCIED threat and CREW technologies to ensure synergy between the technologies. The DoD SM chairs the Joint Program Board and represents the Army at the Force Protection Electronic Countermeasures (ECM) Working Group and Five Eyes (FVEYS) consortium.													
B. Program Change Summary (\$ in Millions)					FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total				
Previous President's Budget					4.890	4.291	4.289	-	4.289				
Current President's Budget					4.241	2.141	0.000	-	0.000				
Total Adjustments					-0.649	-2.150	-4.289	-	-4.289				
<ul style="list-style-type: none"> • Congressional General Reductions • Congressional Directed Reductions • Congressional Rescissions • Congressional Adds • Congressional Directed Transfers • Reprogrammings • SBIR/STTR Transfer • Adjustments to Budget Years 					-	-	-	-	-				
					-	-2.150	-	-	-				
					-	-	-	-	-				
					-	-	-	-	-				
					-	-	-	-	-				
					-0.649	-	-	-4.289	-				
					-	-	-	-	-				
Change Summary Explanation													
FY20 is the last year of funding for this PE.													

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 6					PE 0606001A / Military Ground-Based CREW Technology				FD4 / Military Ground-Based CREW Technology				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
FD4: Military Ground-Based CREW Technology	-	4.241	2.141	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.382	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

Note
In Fiscal Year 2021 (FY21) this Project is Eliminated.

A. Mission Description and Budget Item Justification
The Secretary of the Army was designated the Executive Agent for Military Ground-Based Counter Radio-Controlled Improvised Explosive Device (RCIED) Electronic Warfare (CREW) Technology on 1 December 2013, pursuant to Department of Defense (DoD) Directive 5101.14 "Military Ground-Based Military CREW Technology". The Program Executive Office for Intelligence, Electronic Warfare & Sensors (PEO IEW&S) is assigned Executive Agent responsibilities to fulfill the duties of coordination and support of DoD Military Ground-Based CREW Technology testing and interoperability across all Services and Other Government Agencies (OGA). The PEO is responsible for ensuring joint operational interoperability and compatibility between relevant DoD and Coalition systems; interfaces with all DoD Services and Other Government Agencies (OGA) involved in CREW Technologies; and collaborates with multiple foreign countries on the RCIED threat and CREW technologies to ensure synergy between the technologies. The PEO chairs the Joint Program Board and represents the Army at the Force Protection Electronic Countermeasures (ECM) Working Group and Five Eyes (FVEYS) consortium.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Title: Test Technologies Description: Ensuring joint operational interoperability and compatibility between relevant DoD and Coalition systems; interfaces with all DoD Services and Other Government Agencies (OGA) involved in CREW Technologies; and collaborates with multiple foreign countries on the RCIED threat and CREW technologies to ensure synergy between the technologies. FY 2020 Plans: Funding will be used to provide continued support to cellular test infrastructure, including the sustainment and maintenance of the Advanced Communication Equipment. This includes, but not limited to hardware and personnel to sustain network, radio, backhaul, and instrumentation needed to sustain the network, as well as network connections to core systems. FY 2020 to FY 2021 Increase/Decrease Statement: FY20 is the last year of funding for this Project.	4.241	2.044	-
Title: FY20 SBIR/STTR Transfer Description: Funding transferred in accordance with Title 15 USC ?638	-	0.097	-

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020	
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0606001A / Military Ground-Based CREW Technology	Project (Number/Name) FD4 / Military Ground-Based CREW Technology		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638				
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638		Accomplishments/Planned Programs Subtotals	4.241	2.141
				-
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
N/A				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0606002A / Ronald Reagan Ballistic Missile Defense Test Site							
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	60.808	62.069	71.306	-	71.306	61.451	61.899	71.819	63.986	0.000	453.338
XW9: Reagan Test Site	-	60.808	62.069	71.306	-	71.306	61.451	61.899	71.819	63.986	0.000	453.338

A. Mission Description and Budget Item Justification

The Ronald Reagan Ballistic Missile Defense Test Site (RTS), with its remote location and one-of-a-kind instrumentation systems, provides a valuable strategic test environment that cannot be replicated. Its function is to: 1) support test and evaluation of major Army and Department of Defense (DOD) acquisition programs of strategic importance to the national defense; and 2) provide space operations and intelligence data (Space Situational Awareness, object tracking & identification) in support of United States Strategic Command (USSTRATCOM), acting as a high value contributing sensor to the U.S. Space Surveillance Network. Due to its unique geography and instrumentation, RTS is able to provide unmatched data collection capabilities that provide critical test data for programs of national interest to include: Army Missile Defense; Defense Advanced Research Projects Agency hypersonic Boost-Glide developmental tests; Air Force and Navy Intercontinental Ballistic Missile (ICBM) developmental and operational tests; Army, Air Force, Navy, and Missile Defense Agency (MDA) operational, demonstration, and validation tests; National Aeronautics and Space Administration (NASA) scientific and unique space programs; NASA ionospheric studies; space debris tracking; and data collection in support of space experiments.

Funding in this Program Element (PE) covers management and contracting personnel support (salaries and travel) to enable the management of the test and evaluation of major Army and(DoD) missile systems for the (RTS). Funds also provide contracting support for end item procurement, life cycle acquisition planning, and solicitation, negotiation, award, execution and management for weapon systems contracts. This PE provides contractors to accomplish key operations and maintenance functions for RTS instrumentation suites and also provides mission essential bandwidth via a fiber optic cable system. Funds provide the expertise required for operating and maintaining a number of one-of-a-kind radar, optical, telemetry, command/control/communications, safety, and data reduction systems. These systems include: the four unique radars of the Kiernan Reentry Measurement Site; Super Recording Automatic Digital Optical Tracker long range video-metric tracking systems; high density data recorders for high data-rate telemetry collected by ten antennas; an underwater acoustic impact location system; and data analysis/reduction hardware/software and Continental United States (CONUS) based mission control center. The Advanced Research Project Agency Long-Range Tracking and Instrumentation Radar and the Target Resolution Discrimination Experiment radars located at RTS are the only radars in this area of operation that have deep-space tracking capability. The Millimeter Wave Radar is one of the highest resolution imaging radars in the world, providing critical intelligence data. Funding also enables weapon system assessment of operational effectiveness and suitability for the Army, Air Force, Navy and MDA, which all have programs planned that have significant test and data gathering requirements at RTS. This test data cannot be obtained except through the use of technical facilities available on and in the vicinity of RTS. Program supports Army's PATRIOT air defense system; Air Force's Minuteman III ICBM and the Space and Missile Center's associated programs; MDA's Ballistic Missile Defense System, ICBM Targets, and Layered Ballistic Missile Defense operational tests (including: PATRIOT, Terminal High-Altitude Area Defense , and Aegis Weapon System), and NASA's space experiments.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army					Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)				
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support	PE 0606002A / Ronald Reagan Ballistic Missile Defense Test Site				
B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	62.940	62.069	68.786	-	68.786
Current President's Budget	60.808	62.069	71.306	-	71.306
Total Adjustments	-2.132	0.000	2.520	-	2.520
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.132	-			
• Adjustments to Budget Years	-	-	2.520	-	2.520

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 6					PE 0606002A / Ronald Reagan Ballistic Missile Defense Test Site				XW9 / Reagan Test Site				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
XW9: Reagan Test Site	-	60.808	62.069	71.306	-	71.306	61.451	61.899	71.819	63.986	0.000	453.338	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project covers operations and mission support functions at the Ronald Reagan Ballistic Missile Defense Test Site and is managed by Program Executive Office Missiles & Space.

The Ronald Reagan Ballistic Missile Defense Test Site (RTS), with its remote location and one-of-a-kind instrumentation systems, provides a valuable strategic test environment that cannot be replicated. Its function is to: 1) support test and evaluation of major Army and Department of Defense (DOD) acquisition programs of strategic importance to the national defense; and 2) provide space operations and intelligence data (Space Situational Awareness, object tracking & identification) in support of United States Strategic Command (USSTRATCOM), acting as a high value contributing sensor to the U.S. Space Surveillance Network. Due to its unique geography and instrumentation, RTS is able to provide unmatched data collection capabilities that provide critical test data for programs of national interest to include: Army Missile Defense; Defense Advanced Research Projects Agency hypersonic Boost-Glide developmental tests; Air Force and Navy Intercontinental Ballistic Missile (ICBM) developmental and operational tests; Army, Air Force, Navy, and Missile Defense Agency (MDA) operational, demonstration, and validation tests; National Aeronautics and Space Administration (NASA) scientific and unique space programs; NASA ionospheric studies; space debris tracking; and data collection in support of space experiments.

Funding in this Program Element (PE) covers management and contracting personnel support (salaries and travel) to enable the management of the test and evaluation of major Army and (DoD) missile systems for the (RTS). Funds also provide contracting support for end item procurement, life cycle acquisition planning, and solicitation, negotiation, award, execution and management for weapon systems contracts. This PE provides contractors to accomplish key operations and maintenance functions for RTS instrumentation suites and also provides mission essential bandwidth via a fiber optic cable system. Funds provide the expertise required for operating and maintaining a number of one-of-a-kind radar, optical, telemetry, command/control/communications, safety, and data reduction systems. These systems include the four unique radars of the Kiernan Reentry Measurement Site; Super Recording Automatic Digital Optical Tracker long range video-metric tracking systems; high density data recorders for high data-rate telemetry collected by ten antennas; an underwater acoustic impact location system; and data analysis/reduction hardware/software and Continental United States (CONUS) based mission control center. The Advanced Research Project Agency Long-Range Tracking and Instrumentation Radar and the Target Resolution Discrimination Experiment radars located at RTS are the only radars in this area of operation that have deep-space tracking capability. The Millimeter Wave Radar is one of the highest resolution imaging radars in the world, providing critical intelligence data. Funding also enables weapon system assessment of operational effectiveness and suitability for the Army, Air Force, Navy and MDA, which all have programs planned that have significant test and data gathering requirements at RTS. This test data cannot be obtained except through the use of technical facilities available on and in the vicinity of RTS. Program supports Army's PATRIOT air defense system; Air Force's Minuteman III ICBM and the Space and Missile Center's associated programs; MDA's Ballistic Missile Defense System, ICBM Targets, and Layered Ballistic Missile Defense operational tests (including: PATRIOT, Terminal High-Altitude Area Defense , and Aegis Weapon System), and NASA's space experiments.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 6	PE 0606002A / Ronald Reagan Ballistic Missile Defense Test Site	XW9 / Reagan Test Site	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020
Title: Civilian Pay Description: This effort covers operations and mission support functions at the (RTS) and is managed by U. S. Army Space and Missile Defense Command. FY 2020 Plans: Will continue to provide government personnel support (salaries) to enable the management of the test and evaluation of major Army and DoD missile systems. FY 2021 Plans: Will continue to provide government personnel support (salaries) to enable the management of the test and evaluation of major Army and DoD missile systems. FY 2020 to FY 2021 Increase/Decrease Statement: Funding change reflects planned life cycle of the effort.		5.114	5.535
Title: Temporary Duty (TDY)/Training/Supplies - Military and Civilian Description: Funding will provide for travel and training for civilians and military to assist in the testing of the Army and DoD Missile system Programs. FY 2020 Plans: Will continue to provide government personnel support (training and travel) to enable the management of the test and evaluation of major Army and DoD missile systems. FY 2021 Plans: Will continue to provide government personnel support (training and travel) to enable the management of the test and evaluation of major Army and DoD missile systems. FY 2020 to FY 2021 Increase/Decrease Statement: Funding change reflects planned life cycle of the effort.		0.639	0.752
Title: Outside Obligations/Other Government Agencies (OGAs) Description: Funding provided to other Government Agencies for reimbursable-type work efforts. FY 2020 Plans: Will continue to provide support to test and evaluation of major Army and DoD missile systems. FY 2021 Plans:		8.129	5.997
PE 0606002A: Ronald Reagan Ballistic Missile Defense ... Army	UNCLASSIFIED Page 4 of 8	R-1 Line #208	228

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0606002A / Ronald Reagan Ballistic Missile Defense Test Site	Project (Number/Name) XW9 / Reagan Test Site			
B. Accomplishments/Planned Programs (\$ in Millions) Will continue to provide support to test and evaluation of major Army and DoD missile systems. FY 2020 to FY 2021 Increase/Decrease Statement: Increase due for information assurance and cyber security issues.			FY 2019	FY 2020	FY 2021
Title: Fiber Optic Cable (Kwajalein Cable System (KCS))/Inner Ring Submarine Description: Fiber Optic Cable is Provides lease cost for Fiber Optic Cable between Kwajalein and Guam.			11.443	10.619	9.102
FY 2020 Plans: Will continue to provide funding for lease of the KCS fiber optic cable between Kwajalein Island and Guam, and for backup satellite. Will fund annual fiber maintenance agreement.					
FY 2021 Plans: Will continue to provide funding for lease of the KCS fiber optic cable between Kwajalein Island and Guam, and for backup satellite. Will fund annual fiber maintenance agreement.					
FY 2020 to FY 2021 Increase/Decrease Statement: Funding change reflects planned life cycle of the effort.					
Title: RTS Contractor Prime Pay (KRS) Description: Provide funding for Prime contractor to perform technical Operation and Maintenance support to support test and space missions.			22.525	27.016	31.553
FY 2020 Plans: Will continue to provide technical O&M support (test planning, instrumentation operations and maintenance, systems engineering, flight safety, and launch ordnance) to assure the capability of the Range to support test and space missions. Continues the buy-down of critical maintenance backlog.					
FY 2021 Plans: Will continue to provide technical O&M support (test planning, instrumentation operations and maintenance, systems engineering, flight safety, and launch ordnance) to assure the capability of the Range to support test and space missions.					
FY 2020 to FY 2021 Increase/Decrease Statement: Increased to address critical maintenance backlog and provides for USAV Worthy dry dock maintenance.					
Title: Contractor Material Description: Provide for materials to maintain range capabilities and support test operations.			3.963	3.785	6.837

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 6	PE 0606002A / Ronald Reagan Ballistic Missile Defense Test Site	XW9 / Reagan Test Site	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020
FY 2020 Plans: Will continue to provide critical non-labor materials to maintain critical range capabilities and prevent obsolescence in support of test operations. Continues the buy-down of critical maintenance backlog.			
FY 2021 Plans: Will continue to provide critical non-labor materials to maintain critical range capabilities and prevent obsolescence in support of test operations. Continues the buy-down of critical maintenance backlog.			
FY 2020 to FY 2021 Increase/Decrease Statement: Increased to address critical maintenance backlog issues.			
Title: Federally Funded Research and Development Centers (FFRDC) Contractor Pay Description: Provide for technical expertise to RTS leadership for the overall performance of Range Operations.		5.432	3.154
FY 2020 Plans: Will continue to provide technical advice to RTS leadership in support of Range operations, strategic planning, and technical execution of critical technology.			
FY 2021 Plans: Will continue to provide technical advice to RTS leadership in support of Range operations, strategic planning, and technical execution of critical technology.			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding change reflects planned life cycle of the effort.			
Title: Contractor Pay Meteorological Description: Provide capability for weather sensing capability which allows for test planning and execution of the program.		2.150	1.946
FY 2020 Plans: Will continue to provide support for sustained weather sensing capabilities, including weather reporting via radar data. This capability provides critical data to test planning and execution.			
FY 2021 Plans: Will continue to provide support for sustained weather sensing capabilities, including weather reporting via radar data. This capability provides critical data to test planning and execution.			
FY 2020 to FY 2021 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0606002A / Ronald Reagan Ballistic Missile Defense Test Site	Project (Number/Name) XW9 / Reagan Test Site			
B. Accomplishments/Planned Programs (\$ in Millions) Funding change reflects planned life cycle of the effort.			FY 2019	FY 2020	FY 2021
Title: Ground Transportation			0.861	0.268	0.651
Description: Provide transportation of material and passenger between Kwajalein and continental U.S. (CONUS).					
FY 2020 Plans: Continuing to provide mission specific material and passenger transportation via air (Air Mobility Command) and sea (Surface Deployment and Distribution Command) between Kwajalein Atoll and CONUS.					
FY 2021 Plans: Continuing to provide mission specific material and passenger transportation via air (Air Mobility Command) and sea (Surface Deployment and Distribution Command) between Kwajalein Atoll and CONUS.					
FY 2020 to FY 2021 Increase/Decrease Statement: Funding change reflects planned life cycle of the effort.					
Title: Mission Specific Environmental			0.552	0.423	0.568
Description: Ensures Range Readiness and all regulatory environmental requirements are compliant with range and test requirements.					
FY 2020 Plans: Will continue to provide the capability to assess and maintain the Range Readiness and compliance with environmental requirements.					
FY 2021 Plans: Will continue to provide the capability to assess and maintain the Range Readiness and compliance with environmental requirements.					
FY 2020 to FY 2021 Increase/Decrease Statement: Funding change reflects planned life cycle of the effort.					
Title: FY 2020 SBIR/STTR Transfer			-	2.574	-
Description: Funding transferred in accordance with Title 15 USC ?638					
FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638					
FY 2020 to FY 2021 Increase/Decrease Statement:					

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0606002A / Ronald Reagan Ballistic Missile Defense Test Site	Project (Number/Name) XW9 / Reagan Test Site
B. Accomplishments/Planned Programs (\$ in Millions) Funding transferred in accordance with Title 15 USC ?638	FY 2019	FY 2020
	Accomplishments/Planned Programs Subtotals	60.808
C. Other Program Funding Summary (\$ in Millions)		
N/A		
Remarks		
D. Acquisition Strategy		
N/A		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0606003A / CounterIntel and Human Intel Modernization							
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	2.636	2.925	1.063	4.137	5.200	5.778	4.012	3.997	4.027	Continuing	Continuing
FI9: Counter Intel and Human Intel Modernization	-	2.636	2.925	1.063	4.137	5.200	5.778	4.012	3.997	4.027	Continuing	Continuing
A. Mission Description and Budget Item Justification												
The Counterintelligence (CI) and Human Intelligence (HUMINT) Modernization Program Element (PE) supports ongoing rejuvenation and development of new critical CI and HUMINT systems, applications, tools, equipment, and capabilities necessary to defeat foreign intelligence, international terrorist, and insider threats while enhancing our HUMINT collection capability. The required tools provide Army and DoD leadership, commanders, and warfighters the intelligence necessary for making advantageous operational planning, policies, and timely decisions. Modernization of these systems is a core component of ensuring overmatch on current and future battlefields. Beginning in Fiscal Year (FY) 2019, funding for these efforts was transferred to PE 0606003 / Project FI9 (Counter Intel and Human Intel Modernization) from PE 0303028A (INTEL SPT TO FORCE XXI) / Project FG2 (Counterintelligence & Human Intel Modernization).												
B. Program Change Summary (\$ in Millions)				FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total				
Previous President's Budget				2.636	2.925	2.064	-	2.064				
Current President's Budget				2.636	2.925	1.063	4.137	5.200				
Total Adjustments				0.000	0.000	-1.001	4.137	3.136				
<ul style="list-style-type: none"> • Congressional General Reductions • Congressional Directed Reductions • Congressional Rescissions • Congressional Adds • Congressional Directed Transfers • Reprogrammings • SBIR/STTR Transfer • Adjustments to Budget Years 				-	-	-	-	-				
Change Summary Explanation												
Decrease due to transition to sustainment.												

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 6					PE 0606003A / CounterIntel and Human Intel Modernization				FI9 / Counter Intel and Human Intel Modernization				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
FI9: Counter Intel and Human Intel Modernization	-	2.636	2.925	1.063	4.137	5.200	5.778	4.012	3.997	4.027	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			

A. Mission Description and Budget Item Justification

The Counterintelligence (CI) and Human Intelligence (HUMINT) Modernization Program Element (PE) supports ongoing rejuvenation and development of new critical CI and HUMINT systems, applications, tools, equipment, and capabilities necessary to defeat foreign intelligence, international terrorist, and insider threats while enhancing our HUMINT collection capability. The required tools provide Army and DoD leadership, commanders, and warfighters the intelligence necessary for making advantageous operational planning, policies, and timely decisions. Modernization of these systems is a core component of ensuring overmatch on current and future battlefields. Beginning in Fiscal Year (FY) 2019, funding for these efforts was transferred to PE 0606003 / Project FI9 (Counter Intel and Human Intel Modernization) from PE 0303028A (INTEL SPT TO FORCE XXI) / Project FG2 (Counterintelligence & Human Intel Modernization).

BASE Line of Effort:

CI Support to Force Protection (CIFP) (\$1,063K) provides for updating the Army's Threat Management Information Sharing System, the Army Counterintelligence Operations Portal (ACOP), and partnering with other Service CI entities on a joint CI analysis system development project. Will support development and testing of software code integrating existing and new algorithms to multiple data source to record, identify, sort, and prioritize behaviors.

OCO Lines of Effort:

The Joint Service Counter C4ISR Initiative (\$1,000K) conducts technical analysis and research focused on centers of gravity within the C4ISR architecture of adversary weapon systems that enable successful kinetic and non-kinetic engagements. The Army will use the intelligence provided from this effort to inform the development against key adversary weapon systems.

Emerging GEOINT Collection Integration (\$887K) provides rapid integration of emerging GEOINT capabilities and analysis techniques significantly ahead of the traditional integration timelines. The 513th MI BDE has been given access to pre-release algorithms and capabilities, and can begin, test, development, and validation activities years prior to traditional processes. This capability allows GEOINT focused CME support to identify difficult CT issues and deliver appropriate capabilities needed today in every theater. Each MIB-T that provides GEOINT support will leverage the capability, and its applicability is world-wide. The project funds software and testing to extract, analyze, and validate brand new and emerging classified data sources.

Identity Intelligence Analytic Repository (I2AR) (\$1,250K) is the Department's only automated information system for linking biometric and forensics data with associate information and intelligence data to create the Biometrically Enabled Watchlist (BEWL) and other intelligence analytic products. These efforts will increase the efficiency in which intelligence analysts can make linkage between identities discovered through the use of biometrics and forensics by DoD and derogatory information and intelligence.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army					Date: February 2020				
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0606003A / CounterIntel and Human Intel Modernization	Project (Number/Name) F19 / Counter Intel and Human Intel Modernization							
Pursuit and Exploitation (P&E) (\$1,000K) provides operational gear to support operational needs requirements by filling known intelligence gaps for force deployed. The equipment also provide advancements and risk reduction for current and future system and Programs of Record (PoR). The P&E efforts also aims to improve the support to Long Range Precision Fires (LRPF) that requires an increase in the range of detection, identification, and geolocation of adversarial signals of interest. There is also a need to continue to decrease size, weight, power, and cost in order to give the Army more flexibility for employment. This funding provides software and material necessary to upgrade existing systems and improve support to LRPF and cyber Electronic Warfare Activities. These efforts help ensure capabilities remain relevant in delivering timely, actionable intelligence and targeting to facilitate decision making at the tactical edge. The equipment also provide advancements and risk deduction for current and future systems and Program of Record.									
B. Accomplishments/Planned Programs (\$ in Millions)									
		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total			
Title: Army's Threat Management Information Sharing System		2.636	2.925	1.063	-	1.063			
Description: The Counterintelligence (CI) and Human Intelligence (HUMINT) Modernization Program Element (PE) supports ongoing rejuvenation and development of new critical CI and HUMINT systems, applications, tools, equipment, and capabilities necessary to defeat foreign intelligence, international terrorist, and insider threats while enhancing our HUMINT collection capability. The required tools provide Army and DoD leadership, commanders, and warfighters the intelligence necessary for making advantageous operational planning, policies, and timely decisions. Modernization of these systems is a core component of ensuring overmatch on current and future battlefields. Beginning in Fiscal Year (FY) 2019, funding for these efforts was transferred to PE 0606003/Project F19 (Counter Intel and Human Intel Modernization) from PE 0303028A (Intel Spt to Force XXI)/Project FG2 (Counterintelligence & Human Intel Modernization).									
FY 2020 Plans: Funding supports development and testing of software code integrating existing and new algorithms to analyze multiple data sources to record, identify, sort and prioritize behaviors.									
FY 2021 Base Plans: Will provide for updating of the Army's Threat Management Information Sharing System. Will support development and testing of software code integrating existing and new algorithms to analyze multiple data source to record, identify, sort, and prioritize behaviors indicative of espionage, national security compromises, and other foreign and insider threats.									
FY 2020 to FY 2021 Increase/Decrease Statement: No impact									
Title: C4ISR		-	-	0.000	1.000	1.000			
Description: The Joint Service Counter C4ISR Initiative conducts technical analysis and research focused on centers of gravity within the C4ISR architecture of adversary weapon systems that enable successful kinetic and									

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army				Date: February 2020		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0606003A / CounterIntel and Human Intel Modernization	Project (Number/Name) FI9 / CounterIntel and Human Intel Modernization				
<u>B. Accomplishments/Planned Programs (\$ in Millions)</u>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
non-kinetic engagements. The Army will use the intelligence provided from this effort to inform the development of offensive cyber and advanced electronic warfare capabilities against adversaries.						
FY 2021 Base Plans: N/A						
FY 2021 OCO Plans: Continue the development of offensive cyber						
FY 2020 to FY 2021 Increase/Decrease Statement: Funding remains stable.						
Title: GEOINT Description: GEOINT Collection Integration provides rapid integration of emerging GEOINT capabilities and analysis techniques significantly ahead of the traditional integration timelines. the 513th MI BDE has been given access to pre-release algorithms and capabilities, and can begin test, development, and validation activities years prior to traditional processes. This capability allows GEOINT focused CME support to identify difficult CT issues and deliver appropriate capabilities needed today in every theater. Each MIB-T that provides GEOINT support will leverage the capability, and its applicability is world-wide. The project funds software and testing to extract, analyze, and validate brand new and emerging classified data sources.						- 0.000 0.887 0.887
FY 2021 Base Plans: N/A						
FY 2021 OCO Plans: Focused CME support to identify difficult CT issues and deliver appropriate capabilities needed today in every theater.						
FY 2020 to FY 2021 Increase/Decrease Statement: No impact						
Title: Identity Intelligence Analytic Repository (I2AR) Description: Identity Intelligence Analytic Repository (I2AR) is the Department's only automated information system for linking biometric and forensic data with associate information and intelligence data to create the Biometrically Enabled Watchlist (BEWL) and other intelligence analytic products. These efforts will increase						- 0.000 1.250 1.250

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army				Date: February 2020		
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0606003A / CounterIntel and Human Intel Modernization	Project (Number/Name) FI9 / Counter Intel and Human Intel Modernization				
<u>B. Accomplishments/Planned Programs (\$ in Millions)</u>		FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
the efficiency in which intelligence analysts can make linkage between identities discovered through the use of biometrics and forensics by DoD and derogatory information and intelligence.						
FY 2021 Base Plans: N/A						
FY 2021 OCO Plans: Increase the efficiency in which intelligence analysts can make linkage between identities discovered through the use of biometrics and forensics by DoD and derogatory information and intelligence.						
FY 2020 to FY 2021 Increase/Decrease Statement: No impact						
Title: Pursuit and Exploitation Description: Provides operational gear to support operational needs requirements by filling intelligence gaps for forces deployed. The equipment also provides advancements and risk reduction for current and future systems.		-	-	0.000	1.000	1.000
FY 2021 Base Plans: N/A						
FY 2021 OCO Plans: Provides operational gear to support operational needs requirements by filling intelligence gaps for forces deployed. The equipment also provides advancements and risk reduction for current and future systems.						
FY 2020 to FY 2021 Increase/Decrease Statement: These efforts ensure capabilities remain relevant in delivering timely, actionable intelligence.						
Accomplishments/Planned Programs Subtotals		2.636	2.925	1.063	4.137	5.200
<u>C. Other Program Funding Summary (\$ in Millions)</u>						
N/A						
<u>Remarks</u>						
<u>D. Acquisition Strategy</u>						
N/A						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0606105A / Medical Program-Wide Activities							
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	19.891	-	19.891	20.289	20.695	21.109	21.523	0.000	103.507
CD7: Medical Program-Wide Activities	-	0.000	0.000	19.891	-	19.891	20.289	20.695	21.109	21.523	0.000	103.507

Note

This is a new start in FY2021.

This Program Element (PE) is a New Start for Fiscal Year 2021 (FY21).

A. Mission Description and Budget Item Justification

This Program Element (PE) funds the Continental United States (CONUS) Laboratory Support Clinical Infrastructure and the Outside the Continental United States (OCONUS) Laboratory Infrastructure Support programs. The CONUS and OCONUS laboratory support programs receive funding for research infrastructure management support at select CONUS and OCONUS laboratories and clinical trial sites; work is done in collaboration with Department of Defense Military Treatment Facilities. This program element does not fund research. It funds the infrastructure support staff enabling research scientists to conduct bio-surveillance and early-to-late-stage clinical investigations into biologics, drugs, protectants, device technologies, and knowledge products.

In FY21 programs these programs were transferred from the Defense Health Agency to the United States Army.

B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	19.891	-	19.891
Total Adjustments	0.000	0.000	19.891	-	19.891
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	19.891	-	19.891

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army	Date: February 2020
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support</i>	R-1 Program Element (Number/Name) PE 0606105A / <i>Medical Program-Wide Activities</i>
<p><u>Change Summary Explanation</u></p> <p>FY21 increase a result of funding transferred to the Army from the Defense Health Program (DHP) Research, Development, Testing and Evaluation (RDTE) Program Elements 0606105DHA Projects 401A and 432A.</p>	

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)				Project (Number/Name)				
2040 / 6					PE 0606105A / Medical Program-Wide Activities				CD7 / Medical Program-Wide Activities				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
CD7: Medical Program-Wide Activities	-	0.000	0.000	19.891	-	19.891	20.289	20.695	21.109	21.523	0.000	103.507	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

Note

This Project is a New Start in Fiscal Year 2021 (FY21).

A. Mission Description and Budget Item Justification

Continental United States (CONUS) Laboratory Infrastructure Support funding provides infrastructure and management support for selected laboratories and research sites, enabling basic to late stage clinical investigations on medical products through collaborative efforts with the Military Health System's (MHS) Military Treatment Facilities (MTFs). MTFs provide access to the patient populations who will benefit the most from the medical products and capabilities being developed. The funds support the retention of technical subject matter expertise, independent of the number of assigned projects. The infrastructure funds also support Institutional Review Board functions, research technical support, statistical support, grant writing assistance, and other essential functions for maintaining research in MTFs. The funds do not support research, but provide the infrastructure support enabling MTF investigators to compete for research, development, test, and evaluation (RDTE) research funds.

The Outside of the Continental United States (OCONUS) Laboratory Infrastructure Support provides management support for research infrastructure at selected overseas laboratories and research sites that conduct bio surveillance and basic to late-stage clinical research and evaluation of investigational products, such as biologics, drugs, protectants, technologies, and knowledge products to treat/prevent infectious diseases for the purpose of protecting the Warfighter; this is accomplished through collaborative efforts with the respective host nation governments. These sites are the US Army Medical Research Directorate-Kenya (USAMRD-K) in Nairobi, Kenya, the US Army Medical Research Directorate-Georgia (USAMRD-G) in Tbilisi, Georgia, and the US Army Medical Directorate-Armed Forces Research Institute of Medical Sciences (USAMD-AFRIMS) in Bangkok, Thailand. USAMRD-G is the newest laboratory, and provides support in the Caucasus region, similar to that provided by the laboratories in Kenya and Thailand to East Africa and Southeast Asia regions.

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

Title: Medical Program-Wide Activities

Description: CONUS Laboratory Infrastructure Support management for research infrastructure at select laboratories and research sites that conduct basic to late-stage clinical research and evaluation of investigational products, such as biologics, drugs, and devices to treat/prevent poly trauma (multiple traumatic injuries), through collaborative efforts with the MHS MTFs.

OCONUS Laboratory Infrastructure Support management for research infrastructure at selected overseas laboratories and research sites is integral to support the predicting, detecting, preventing, and treating infectious disease threats to the US military,

	FY 2019	FY 2020	FY 2021
	-	-	19.891

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0606105A / Medical Program-Wide Activities	Project (Number/Name) CD7 / Medical Program-Wide Activities	
B. Accomplishments/Planned Programs (\$ in Millions)			
as well as support for surveillance, training, research, and response activities for emerging infectious disease threats that could affect Service members in those regions. Supported OCONUS laboratories are the US Army Medical Directorate-Armed Forces Research Institute of Medical Sciences (AFRIMS) in Bangkok, Thailand; the US Army Research Directorate-Kenya (USAMRD-K) in Nairobi, Kenya, and the US Army Medical Research Directorate-Georgia (USAMRD-G) in Tbilisi, Georgia.			FY 2019
<p>FY 2021 Plans: The CONUS Laboratory Support Clinical Infrastructure project will support efforts for military medical research. These efforts will include support staff engaged in multiple clinical investigations and performing critical roles in research subject engagement, development and review of research protocols, and the creation, analysis, and communication of research data. Efforts with the funding will include: support for clinical investigations, submission for external funding applications, sustainment of a Clinical Investigation Committee to review research protocols and provide research support services, solicitation of collaborative research partnerships with non-federal organizations, utilization of funding opportunities database to assist MTF investigators, and identification of ways to improve submission competitiveness.</p> <p>The OCONUS Laboratory Support Clinical Infrastructure project will support sustainment of the administration and infrastructure support for USAMD-AFRIMS, USAMRD-K, and USAMRD-G laboratories. These laboratories will provide medical research platforms for surveillance, testing, and evaluation of products to inform the development of interventions for military-relevant endemic diseases. Administration and infrastructure will support efforts include resource management, logistics, safety, information technology activities, salaries, utilities, maintenance, transportation, shipping, vehicle maintenance and generator fuel.</p>			FY 2020
<p>FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred from the Defense Health Program (DHP) RDTE Program Elements 0606105DHA Projects 401A and 432A, starting in FY21.</p>			FY 2021
Accomplishments/Planned Programs Subtotals			- - 19.891
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0606942A / Assessments and Evaluations Cyber Vulnerabilities							
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	88.300	4.500	4.496	-	4.496	4.496	4.496	4.676	4.723	0.000	115.687
FL2: Cyber Vulnerabilities Assessments and Evaluations	-	88.300	4.500	4.496	-	4.496	4.496	4.496	4.676	4.723	0.000	115.687

A. Mission Description and Budget Item Justification

The National Defense Authorization Acts (NDAA), Fiscal Years (FY) 16 Section 1647, and FY 17 Section 1650, directs the office of the Secretary of Defense (OSD) to complete an evaluation of cyberspace vulnerabilities of select DoD weapon systems and critical infrastructures. For NDAA 1647, the Army was directed to assess and mitigate twenty-four weapon systems NLT December 31, 2019. For NDAA 1650, the Army was directed to assess and submit a mitigation strategy for twenty-five installations, NLT 31 December, 2020. To support this mandate, the HQDA G-3 directed DAMO-CY to evolve the two congressional mandates into two enduring Army programs: the Cyber Operational Resiliency Assessment-Platforms (CORA-P) to replace NDAA 1647, and the Cyber Operational Resiliency Assessment-Installations (CORA-I) to replace NDAA 1650. The aim of CORA-P/I is to reduce the Army's risk to adversarial cyber intrusions or attacks that compromises the Army weapon and installation systems. In compliance with the congressional mandates, DAMO-CY's performance objectives is to provide governance oversight over the execution of CORA-P/I phased vulnerability assessments to support o the Planning, Programming, Budgeting and Execution (PPBE) cycle. These deliverables include identifying the means to mitigate CORA-P/I vulnerabilities.

This Program Element (PE) funds cyber vulnerabilities evaluations of major weapon systems in alignment with Section 1647 of the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2016, and of critical infrastructure in alignment with Section 1650 of NDAA 2017. Efforts in this PE will: 1) identify, assess, and develop and identify non-recurring engineering (NRE) to mitigate operational risks from cyber vulnerabilities to critical Army weapon systems in an operational configuration; and 2) assure the confidentiality, availability, and integrity of the information and control systems that underpin Army facilities and critical infrastructure by inventorying and assessing Facility-Related Control Systems (FRCS).

Weapon systems evaluations will assess and provide NRE recommendations to mitigate operational risks emanating from a peer or near-peer adversary profile in accordance with existing test/lab requirements of through acquisition cycle. Where applicable, these evaluations will include tabletop exercises, lab assessments, and exercise/operational assessments of Program Executive Officer Command, Control, Communications-Tactical (PEO C3T) and ground weapon systems. Cyber hardening efforts will be informed by the vulnerability assessments reports (VAR) generated through the assessment and prioritization process. Prioritization will be based on mission criticality, impact to readiness, and threat. When applicable, this PE also provides for Red Team enhancement to support Combatant Command mission-level cyber vulnerability assessments.

Evaluations of cyber vulnerabilities to critical infrastructure will focus on Task Critical Assets, Defense Critical Assets, and on units with high priority Quadrennial Defense Review missions and their supporting infrastructure. When necessary, this PE will provide for the training of teams to conduct cyber vulnerability evaluations on critical infrastructure. Once trained, these teams will conduct cooperative vulnerability and penetration assessments (Blue Teaming), adversarial assessments (Red Teaming), and assist with conducting assessments of cyber dependencies, vulnerabilities and threats in accordance with DoDI 8501.1 "Risk Management Framework." Funding will also provide for Contractor subject matter expertise to conduct Security Control Assessments and Deep Cyber Resiliency Assessments.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army					Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)				
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support	PE 0606942A / Assessments and Evaluations Cyber Vulnerabilities				
B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	88.300	4.500	4.500	-	4.500
Current President's Budget	88.300	4.500	4.496	-	4.496
Total Adjustments	0.000	0.000	-0.004	-	-0.004
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-0.004	-	-0.004

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0606942A / Assessments and Evaluations Cyber Vulnerabilities					Project (Number/Name) FL2 / Cyber Vulnerabilities Assessments and Evaluations			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
FL2: Cyber Vulnerabilities Assessments and Evaluations	-	88.300	4.500	4.496	-	4.496	4.496	4.496	4.676	4.723	0.000	115.687	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Program Element (PE) funds cyber vulnerabilities evaluations of major weapon systems in alignment with Section 1647 of the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2016, and of critical infrastructure in alignment with Section 1650 of NDAA 2017. Efforts in this PE will: 1) identify, assess, and develop and identify non-recurring engineering (NRE) to mitigate operational risks from cyber vulnerabilities to critical Army weapon systems in an operational configuration; and 2) assure the confidentiality, availability, and integrity of the information and control systems that underpin Army facilities and critical infrastructure by inventorying and assessing Facility-Related Control Systems (FRCS).

Weapon systems evaluations will assess and provide NRE recommendations to mitigate operational risks emanating from a peer or near-peer adversary profile in accordance with existing test/lab requirements of through acquisition cycle. Where applicable, these evaluations will include tabletop exercises, lab assessments, and exercise/operational assessments of Program Executive Officer Command, Control, Communications-Tactical (PEO C3T) and ground weapon systems. Cyber hardening efforts will be informed by the vulnerability assessments reports (VAR) generated through the assessment and prioritization process. Prioritization will be based on mission criticality, impact to readiness, and threat. When applicable, this PE also provides for Red Team enhancement to support Combatant Command mission-level cyber vulnerability assessments.

Evaluations of cyber vulnerabilities to critical infrastructure will focus on Task Critical Assets, Defense Critical Assets, and on units with high priority Quadrennial Defense Review missions and their supporting infrastructure. When necessary, this PE will provide for the training of teams to conduct cyber vulnerability evaluations on critical infrastructure. Once trained, these teams will conduct cooperative vulnerability and penetration assessments (Blue Teaming), adversarial assessments (Red Teaming), and assist with conducting assessments of cyber dependencies, vulnerabilities and threats in accordance with DoDI 8501.1 "Risk Management Framework." Funding will also provide for Contractor subject matter expertise to conduct Security Control Assessments and Deep Cyber Resiliency Assessments.

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

Title: Cyberspace Operational Resiliency Assessment ? Platform (CORA-P)	FY 2019	FY 2020	FY 2021
Description: CORA-P is the Army's response to Section 1647 of the 2016 National Defense Authorization Act (NDAA) which directed the Department of the Defense (DoD) to evaluate cyber vulnerabilities of major weapon systems. DAMO-CY will be the oversight governing body overseeing the assessments and NRE mitigations process to cyber vulnerabilities identified in the VAR.	37.450	2.250	2.248
FY 2020 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)	
2040 / 6	PE 0606942A / Assessments and Evaluations Cyber Vulnerabilities	FL2 / Cyber Vulnerabilities Assessments and Evaluations	
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
The funding provides DAMO-CY the opportunity to complete evaluation of the 24 critical weapon systems and the 26 critical infrastructures for cyber vulnerabilities, identified by the DoD, in support of NDAs 1647 and 1650. This includes lab assessments, tabletop exercises, and additional analytical, exercise, and or operational assessments. This funding provides DAMO-CY the ability to develop Red Team capacity to carry out Combatant Command (COCOM) mission level assessments. Cyber hardening efforts will be informed by the vulnerability assessments reports (VAR) generated through the assessment and prioritization process. Prioritization will be based on mission criticality, impact to readiness, and threat analysis.			
FY 2021 Plans: The funding provides DAMO-CY the opportunity to complete evaluation of the 24 critical weapon systems and the 26 critical infrastructures for cyber vulnerabilities, identified by the DoD, in support of NDAs 1647 and 1650. This includes lab assessments, tabletop exercises, and additional analytical, exercise, and or operational assessments. This funding provides DAMO-CY the ability to develop Red Team capacity to carry out Combatant Command (COCOM) mission level assessments. Cyber hardening efforts will be informed by the vulnerability assessments reports (VAR) generated through the assessment and prioritization process. Prioritization will be based on mission criticality, impact to readiness, and threat analysis			
FY 2020 to FY 2021 Increase/Decrease Statement: Nominal change in program.			
Title: Cyberspace Operational Resiliency Assessment ? Installation (CORA-I) Description: CORA-I is the Army's response to Section 1650 of the 2017 NDAA. Evaluations of cyber vulnerabilities to critical infrastructure will focus on Task Critical Assets, Defense Critical Assets, and on units with high priority Quadrennial Defense Review missions and their supporting infrastructure. When necessary, this PE will provide for the training of teams to conduct cyber vulnerability evaluations on critical infrastructure. Once trained, these teams will conduct cooperative vulnerability and penetration assessments (Blue Teaming), adversarial assessments (Red Teaming), and assist with conducting assessments of cyber dependencies, vulnerabilities and threats in accordance with DoDI 8501.1 "Risk Management Framework." Funding will also provide for Contractor subject matter expertise to conduct Security Control Assessments and Deep Cyber Resiliency Assessments.	37.450	2.250	2.248
FY 2020 Plans: Funding provides for the training of teams to conduct cyber vulnerability assessments on critical infrastructure. Once trained these teams will conduct cooperative vulnerability and penetration assessments (Blue Teaming), adversarial assessments (Red Teaming), and assist with conducting assessments of cyber dependencies, vulnerabilities and threats in accordance with DoDI 8501.1 "Risk Management Framework." Funding also provides for Contractor subject matter expertise to conduct Security Control Assessments and Deep Cyber Resiliency Assessments. The 2017 Army Cybersecurity Strategy for FRCS further established the requirement to inventory and conduct Risk Management Framework on select-DoD legacy systems. The Unified Facility			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 6	R-1 Program Element (Number/Name) PE 0606942A / Assessments and Evaluations Cyber Vulnerabilities	Project (Number/Name) FL2 / Cyber Vulnerabilities Assessments and Evaluations	
B. Accomplishments/Planned Programs (\$ in Millions) Criteria 4-010-06 also established the requirement to design cybersecurity protections into FRCS within all new MILCON projects. Cyber hardening efforts will be informed by the vulnerability assessments reports (VAR) generated through the assessment and prioritization process. Prioritization will be based on mission criticality, impact to readiness, and threat.		FY 2019	FY 2020
FY 2021 Plans: Funding provides for the completion of the select-DoD twenty-five critical infrastructures assessments already in some stage of the evaluation process, identified as part of the Section 1650 directive, executed through on-sight assessments. These assessments result in VAR in support of the PPBE cycle. Funding also provides developing and maintaining a Red and Blue teams carry out on-site assessments. Cyber hardening efforts will be informed by the vulnerability assessments reports (VAR) generated through the assessment and prioritization process. Prioritization will be based on mission criticality, impact to readiness, and threat.			FY 2021
FY 2020 to FY 2021 Increase/Decrease Statement: Nominal change in program.			
Title: Fiscal Year 2019 (FY19) Pending Recission			13.400
Description: FY19 Pending Recission			-
Accomplishments/Planned Programs Subtotals			4.496
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020			
Appropriation/Budget Activity					R-1 Program Element (Number/Name)									
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0909980A / Judgment Fund Reimbursement									
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost		
Total Program Element	-	0.122	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.122		
JFR: JUDGMENT FUND REIMBURSEMENT	-	0.122	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.122		
A. Mission Description and Budget Item Justification														
Judgment Fund Reimbursement														
B. Program Change Summary (\$ in Millions)				FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total						
Previous President's Budget				0.000	0.000	0.000	-	0.000						
Current President's Budget				0.122	0.000	0.000	-	0.000						
Total Adjustments				0.122	0.000	0.000	-	0.000						
<ul style="list-style-type: none"> • Congressional General Reductions • Congressional Directed Reductions • Congressional Rescissions • Congressional Adds • Congressional Directed Transfers • Reprogrammings • SBIR/STTR Transfer 				-	-	-	-							
				0.122	-	-	-							
				-	-	-	-							

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020		
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0909980A / Judgment Fund Reimbursement				Project (Number/Name) JFR / JUDGMENT FUND REIMBURSEMENT				
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost	
JFR: JUDGMENT FUND REIMBURSEMENT	-	0.122	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.122	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification													
Judgment Fund Reimbursement													
B. Accomplishments/Planned Programs (\$ in Millions)													
<i>Title:</i> Judgment Fund Reimbursement											0.122	-	-
Accomplishments/Planned Programs Subtotals											0.122	-	-
C. Other Program Funding Summary (\$ in Millions)													
N/A													
Remarks													
D. Acquisition Strategy													
N/A													

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army											Date: February 2020				
Appropriation/Budget Activity					R-1 Program Element (Number/Name)										
2040: Research, Development, Test & Evaluation, Army / BA 6: RDT&E Management Support					PE 0909999A / Financing for Cancelled Account Adjustments										
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost			
Total Program Element	-	0.236	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.236			
900: CLOSED ACCT ADJMT-M	-	0.236	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.236			
A. Mission Description and Budget Item Justification															
Financing for Closed Account Adjustments															
B. Program Change Summary (\$ in Millions)				FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total							
Previous President's Budget				0.000	0.000	0.000	-	0.000							
Current President's Budget				0.236	0.000	0.000	-	0.000							
Total Adjustments				0.236	0.000	0.000	-	0.000							
<ul style="list-style-type: none"> • Congressional General Reductions • Congressional Directed Reductions • Congressional Rescissions • Congressional Adds • Congressional Directed Transfers • Reprogrammings • SBIR/STTR Transfer 				-	-	-	-								
				0.236	-	-	-								
Change Summary Explanation															
FY18 increase reflects Financing for Cancelled Account Adjustments.															

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army											Date: February 2020	
Appropriation/Budget Activity 2040 / 6					R-1 Program Element (Number/Name) PE 0909999A / Financing for Cancelled Account Adjustments				Project (Number/Name) 900 / CLOSED ACCT ADJMT-M			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
900: CLOSED ACCT ADJMT-M	-	0.236	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.236
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	

A. Mission Description and Budget Item Justification
This program accomplishes closed account adjustments.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Title: Financing for Closed Account Adjustments	0.236	-	-
Accomplishments/Planned Programs Subtotals	0.236	-	-

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

Remarks

D. Acquisition Strategy
N/A